ROLE OF BANKING SECTOR IN AGRICULTURAL FINANCE DURING THE POST REFORM PERIOD

THESIS
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BY

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UNDER THE SUPERVISION OF

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Certificate

This is to certify that the thesis entitled **"Role of Banking sector in Agricultural Finance during the Post-reform period"** being submitted by **Mr. Jiyaur Rahman** to the Department of Economics, Aligarh Muslim University, Aligarh, for the award of the degree of Doctor of Philosophy is a bonafide piece of research work carried out by him under my guidance and supervision. This is an original work and has not been submitted in part or full for any other degree/diploma at this or any other university/institute. This thesis is fit to be considered for the award of the degree of Doctor of Philosophy in Economics.

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ABBREVIATION

AGDP	Agricultural Gross Domestic Product
AIRCRC	All India Rural Credit Review Committee
AIRCS	All India Rural Credit Survey
ALF	Agricultural Labour Force
ARC	Agricultural Refinance Corporation
ARDC	Agriculture Refinance and Development Corporation
CAGR	Compound Annual Growth Rate
CD	Cobb-Douglas
CRAFICARD	Committee to Review Arrangements for Institutional Credit for Agriculture and Rural Development
CRR	Cash Reserve Ratio
CV	Coefficient of Variation
DACP	Doubling Agricultural Credit Policy
DCCBs	District Central Co-operative Banks
FR	Fertilizer Consumption
FYP	Five Year Plan
GCA	Gross Cropped Area
GDP	Gross Domestic Product
GIA	Gross Irrigated Area
GSA	Gross Sown Area
IC	Institutional Credit
KCCS	Kisan Credit Card Scheme
MFIs	Micro Finance Institutions
NABARD	National Bank, to be known as National Bank for Agriculture and Rural Development
NBC	Net Bank Credit
NPAs	Non-Performing Assets
OLS	Ordinary Least Squares
OTS	One-Time Settlement
PACS	Primary Agricultural Credit Societies

PCARDBs	Primary Co-operative Agricultural and Rural Development Banks
P value	Probability value
RBI	Reserve Bank of India
RIDF	Rural Infrastructure Development Fund
RN	Rainfall
RRBs	Regional Rural Banks
SBI	State Bank of India
SCARDBs	State Co-operative Agricultural and Rural Development Banks
SCBs	Scheduled Commercial Banks
SHGs	Self Help Groups
SLR	Statutory Liquidity Ratio
StCBs	State Co-operative Banks
UPA	United Progressive Alliance

Chapter- 1

Introduction

CHAPTER-1

INTRODUCTION

1.1 Background

Agriculture, in most of the developing countries, is an important sector providing livelihood to a significant proportion of the population, especially in rural areas. India, being a developing economy, recognises the importance of agriculture in the process of economic development. It provides livelihood to around 60 per cent of the total population and generates employment for about 58.2 per cent of the country's work force. The sector has contributed 14.6 per cent to the gross domestic product in the financial year of 2009-10.

The introduction of modern technology to agricultural sector during the latter half of 1960s (Green Revolution era)[1] in India has made a remarkable increase in food grains production. The production has increased from 72.35 million tonnes in 1965-66 to 176.4 million tonnes in 1990-91, which further increased to 218.1 million tonnes in 2009-10. This tremendous growth was made possible by the adoption of high yielding varieties of seeds particularly wheat and rice crops, expansion in irrigation facilities, higher use of modern inputs (like fertilizers, pesticides, etc.), expansion of agricultural market infrastructure, regulation of minimum support price policy, development of infrastructure and institutions like power, village roads and institutional agricultural credit.

Although the use of modern techniques has made India a self-sufficient country in the area of food grain production, the condition of majority of farmers deteriorated. This is because about 80 per cent of Indian farmers are small and marginal with low levels of income. Hence, inability to save and invest in modern technology due to low level of income brings them to low level of agricultural production.

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1 The introduction of high-yielding varieties of seeds and the increased use of chemical fertilizers and irrigation are known collectively as the Green Revolution, which provided the increase in production needed to make India self-sufficient in food grains, thus improving agriculture in India. High-yielding wheat was first introduced to India in 1968 by American agronomist Norman Borlaug. Borlaug has been hailed as the "Father of the Green Revolution" but M.S. Swaminathan is known as the "Father of the Green Revolution in India".

Development of agriculture can take place only if farmers move from traditional to modern agriculture. This transformation calls for provision of substantial credit for agriculture, besides a large variety of inputs and services. Agricultural credit which is one of the essential inputs in agricultural production helps in creating environment for the adoption of modern production technology and encouraging private investments on the farms. It is also helpful for changing the composition and distribution of production in favour of deficit producers. Improved access to formal credit is supposed to shift rural borrowings from informal market to formal institutions, increasing the use of improved inputs and technology, leading to increased production and higher income for the rural poor. (Donald, 1976; George, *et al.*, 1985; Sidhu and Gill, 2006).

In India, the problem of adequate and cheap credit is one of the perpetual problems of Indian agriculture. To overcome this problems and to provide protection to those farmers who rely highly on informal sources of finance like moneylenders, landlords and traders etc. who exploit them by charging unreasonably high rate of interest, Indian government emphasized on adequate and timely supply of institutional credit to farmers. The following table shows the relative share of borrowing of cultivator households from different sources.

Table 1.1: Relative Share of Borrowing of Cultivator Households from Different Sources

(Per cent)

	1951	1961	1971	1981	1991	2002
Institutional Agencies	**7.2**	**14.8**	**29.2**	**61.2**	**64.0**	**57.1**
Government	3.3	5.3	6.7	4.0	5.7	2.3
Co-operatives	3.1	9.1	20.1	28.6	18.6	27.3
Commercial Banks (including RRBs)	0.8	0.4	2.2	28.0	29.0	24.5
Others institutional agencies*			0.2	0.6	10.7	3.0
Non-Institutional Agencies	**92.8**	**85.2**	**70.8**	**38.8**	**36.0**	**42.9**
Landlord	1.5	0.9	8.6	4.0	4.0	1.0
Agricultural Moneylender	24.9	45.9	23.1	8.6	6.3	10.0
Professional Moneylender	44.8	14.9	13.8	8.3	9.4	19.6
Traders and Commission Agents	5.5	7.7	8.7	3.4	7.1	2.6
Relatives and Friends	14.2	6.8	13.8	9.0	6.7	7.1
Others	1.9	8.9	2.8	4.9	2.5	2.6
Total	100	100	100	100	100	100

Note: * includes insurance, provident fund, financial corporations/institutions, financial companies and other institutional agencies.

Source: Discussion Paper prepared by Dept. of Banking Operations and Development (DBOD) and Dept. of Economic and Policy Research (DEPR), 2013, Reserve Bank of India.

Available data in Table 1.1 indicates that the institutional finance to rural areas have not displaced non-institutional sources of credit in the recent time. Though the share of total institutional credit to the total increased from 7.2 per cent in 1951 to 29.2 per cent in 1971 which further increased to 64.0 per cent in 1991, it fell to 57.1 per cent in 2002. As a consequence, the share of total non-institutional credit to the total credit decreased from 92.8 per cent in 1951 to 70.8 per cent in 1971 which further decreased to 36.0 per cent in 1991 and after that it increased to 42.9 per cent in 2002.

Several initiatives have been taken in this regard since independence. Some major landmarks in rural credit are the acceptance of All India Rural credit Survey Committee Report (AIRCS)[2]in 1954, introduction of social control over banks[3] in 1967, nationalisation of 20 major commercial banks in 1969 and 1980, establishment of Regional Rural Banks (RRBs) in 1975, setting up of National Bank for Agriculture and Rural Development (NABARD) in 1982, and reforms in the financial sector since 1991.Simultaneously, several measures like establishment of Lead Bank Scheme, Direct lending for the Priority sectors, Banking sectors Linkage with the Government sponsored programmes targeted at the poor, Differential Rate of interest (DRI) Scheme[4], the Service Area Approach (SSA)[5], the Self Help Group (SHGs)-Bank Linkage programme since 1992, Kisan Credit Card Scheme (KCC)since 1998-99, formulation of the Special Agricultural Credit Plans by the public sector banks since 2004-05, and target to double the flow of institutional agricultural credit in 2005-07 by all financial institutions. Several committees/working groups/task forces have been constituted to suggest ways to increase the availability of institutional credit to the agriculture sector.

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2 The All India Rural Credit Survey (AIRCS) Report was released in 1954 by the Gorwala Committee, appointed by the Reserve Bank of India, which undertook a comprehensive survey of rural credit.

3 The Government of India introduced the scheme of Social Control over commercial banks in the early of 1968. Under this scheme the banks were expected to diversify bank credit more widely and extend to priority sectors like agriculture and small scale industry. This brought the commercial banks in the field of agricultural credit.

4 Under the Differential Rate of Interest Scheme, introduced in 1972, public sector banks are required to fulfil the target of lending of at least one per cent of the total advances as at the end of the preceding year to the weakest of the weak sections of the society at an interest rate of four per cent per annum.

5 Service Area Approach was introduced in April 1989 under which each semi-urban and rural branch of commercial banks was assigned a specific area comprising a cluster of villages within which it would operate, adopting a planned approach for its development. The rationale of this approach was to avoid wider areas.

1.2 Evolution of Institutional Finance to Agriculture sector in India

The first action taken by the government for providing agricultural credit directly to the farmers could be traced back to the late 19th century in India under the British Government. The agricultural credit which was provided from the government was called '*taccavi*'. This credit was given under the Land Development Loans Act of 1883 for long-term loans, and the Agriculturist Loan Act of 1884 for short and medium-term loans. Under the former, long term loans were given for undertaking land improvement measures like construction of wells or building of embankments, tanks, water-courses, preparation of land for irrigation, protection of land from flood or erosion. Such loans were generally advanced for periods extending over 25 years on the security of landed property. Under the latter, short and medium-term loans were provided for the purchase of seeds, cattle, manure, implements and the purchase of houses to replace those destroyed by flood. Such loans were repayable after the harvest (Rathore, 1994).

Institutional credit system for the agriculture sector in India was started with the organisation of co-operative credit societies at the beginning of the 20th century. It was set up in 1904 under the Cooperative Credit Societies Act with basic objective to eradicate local money lenders who usually exploit the farmers by charging unreasonable rates of interest which made them indebted and poor. It emphasises thrift and mutual help and to provide cheap credit to the farmers. But the real beginning of cooperative movement was made from the year 1912 when the defects of Act of 1904 were removed through the Cooperative Societies Act, 1912.

The Maclagen Committee (1915) recommended a three-tier cooperative credit structure in every province with Primary Agricultural Credit Societies (PACS) at the village level (grass root level); District Central Co-operative Banks (DCCBs) at District/Intermediary level and State Co-operative Banks (StCBs) at state level to provide crop and other working capital loans to farmers and rural artisans primarily for short and medium-term purposes.

The setting up of the Reserve Bank of India (RBI) in 1934 was a major development in the thrust for agricultural credit. Specific provisions were made in the Reserve Bank of India Act, 1934 both for the establishment of an Agricultural Credit Department (ACD) in the bank and for extending refinance facilities to the

cooperative credit system. Emphasis was laid on setting up, strengthening and promoting financially viable provincial cooperative banks, central cooperative banks, marketing societies and primary agricultural credit societies in each province.

The long-term credit was for the first time established at Jhind in Punjab with the name of Land Mortgage Bank in 1920, followed by organisation of similar banks in Madras in 1925 and Bombay in 1929. These banks extended credit on the security of mortgages and raise funds on its basis by issuing debentures which are fully guaranteed by the state governments. Initially, it aimed at helping the farming community getting out of the clutches of moneylenders but later on it started to purvey production credit for acquisition of farm assets.

A three-tier system of agricultural cooperative credit came into existence in India by 1944. These credit institutions, based on the nature of their lending operations, have typically been divided into two distinct parts, commonly known as the short-term co-operative credit structure which comprises PACS, DCCBs and StCBs and the long-term co-operative credit structure which includes State Co-operative Agricultural and Rural Development Banks (SCARDBs) at the State level and the Primary Co-operative Agricultural and Rural Development Banks (PCARDBs) at the district or block level, provide typically long-term loans for making investments in agriculture, rural industries etc. However, the structure of rural co-operative banks is not uniform across all the states of the country. Some states have a unitary structure with the state level banks operating through their own branches, while others have a mixed structure incorporating both unitary and federal systems. In this way the cooperative credit structure in the country has two wings, one chiefly supplying the short and medium-term credit requirements and the other, long-term investment credit.

The All India Rural Credit Survey (AIRCS), 1954, while analysing the role of *taccavi* loans, described it as *"ill-suited disbursement of inadequate moneys through an ill-suited agency"*. The committee further observed that the record of *taccavi* was a record of inadequacies of amount, inconvenience of timing and incidental delays, inefficiency of supervision and incompleteness of co-ordination. It was observed that except in times of famines, floods and draughts these loans cannot be considered as a major source of credit for the cultivators (Tomar, 1974; Mohideen, 1991). Due to these reasons, the moneylender who was an expert in knowledge of crops, climate,

soil, etc. and condition of the borrower came forward and provided sufficient and timely credit to the farmers for agricultural operations. They even facilitated credit easily for unproductive expenditure on various religious and social ceremonies with usurious rate of interest. The usurious rates of interest charged by the them, coupled with the unproductive use of the borrowed funds, made the debt burden heavy which became chronic not because of borrowing but because of failure to repay owing to the unproductive use of the funds borrowed (Naidu, 1968). On the other side, due to high dependency on monsoon some productive expenditure by the farmers also faces the risk of unpredictable production of crops which lead to rural indebtedness. This proved that the *"Indian peasant is born in debt, lives in debt and dies in debt"* (Darling, 1925).

Naidu observed that co-operative credit societies were the best instrument for supplying credit to the multitude of small farmers during the early half of the 20th century with the exception of some financing by the commercial banks and *taccavi* loans by the government. He further pointed out that the co-operative credit societies not only reduces the cost of credit but also teaches the habits of thrift, punctuality and prudence in its use (Naidu, 1968). In this context the Royal Commission on Agriculture in India, 1926 has observed that *"if cooperation fails, there will fail the best hope of rural India"*.

On the recommendations of the AIRCS, the Imperial Bank of India was converted into State Bank of India (SBI) in July 1955. Its main objective was to reorient it to rural banking and rural finance. The commercial banks came into the realm of agriculture credit in 1969, after the recommendation of All India Rural Credit Review Committee (AIRCRC)[6]. The Committee observed that:

> *"At the same time, effort in the sphere of rural credit should not be solely concentrated in the co-operative sector. Co-operatives should be strengthened, but they would be the entire better-and the farmer better served- if other institutions co-existed with them in healthy competition."*

Commercial banks were, therefore, inducted into the field of agricultural credit under the policy of Social Control over banks in 1968.Under this scheme the banks were expected to diversify bank credit more widely and extend credit to priority

6 The All India Rural Credit Review Committee was set up by RBI in 1969 under the chairmanship of B. Venkatappiah to suggest measures for the adequate and timely supply of agricultural credit through co-operatives and commercial banks.

sectors like agriculture and small scale industry. As the objectives of social control over commercial banks, 14 major commercial banks were nationalised in July 19, 1969[7], having deposits of ₹ 50 crore and above. The main aim of nationalisation was to force the pace of expansion of commercial bank branches in rural areas and to augment the flow of bank credit through rural branches to agriculture and weaker sections of society (Reddy, 1990). Commercial banks which were following urban-centred lending policy were to involve themselves in the process of rural development through their lending to the priority sector. This led to the opening of new offices in the previously unbanked areas and also increases in rural lending. This approach which has come to be known as the "multi-agency approach" provides for commercial banks serving as an additional source of credit to the rural sector.

After nationalisation, lending to priority sectors became an essential component of bank lending. In this way the description of the priority sector was formalised in 1972 on the basis of the report submitted by the "Informal Study Group on Statistics Relating to Advances to the Priority Sectors" constituted by Reserve Bank of India in May 1971. The Report prescribed a modified return for reporting priority sector advances and certain guidelines were issued in this connection indicating the scope of the items to be included under the various categories of priority sector. Although initially there was no specific target fixed in respect of priority sector lending. In November 1974 the banks were advised to raise the share of these sectors in their aggregate advances to the level of 33 1/3 per cent by March 1979.

Despite the tremendous growth of the cooperatives and the commercial banks as purveyors of rural credit, need was still felt for specialized financial institutions to cater to the needs of the weaker sections of rural society and to supplement the work of commercial and cooperative banks. On this ground, the Narasimham Committee (1975) came to the conclusion that the regional and functional gaps in the rural credit cannot be met within a reasonable period by reorganising or restructuring the cooperative and commercial bank system. So the committee recommended the setting up of state sponsored region based rural oriented commercial banks which came to be known as Regional Rural Banks (RRBs) and were established in 1975. The intention for setting up of RRBs was to create an institution combining the knowledge of rural

7 Six more banks were nationalised in April 1980, having a deposits of ₹ 200 crore and above.

problems which co-operatives possessed and the degree of business organisation and modernisation outlook which the commercial banks had (Singh, 2000).These banks were also scheduled commercial banks(SCBs) supported by the government but sponsored by the commercial banks. They were located in district headquarters with branches within the district. Some of them serve more than one district. They were introduced to lend exclusively to landless labourers, marginal farmers, small farmers and artisans, though they can mobilize deposits from all. These banks provide institutional credit to the weaker sections of the society at concessional rate of interest. Initially, five RRBs started working from October 2, 1975 in four states, two in Uttar Pradesh, one in Haryana, one in Rajasthan and one in West Bengal.

In March 1979 the RBI, in consultation with the Government of India, set-up a Committee to Review Arrangements for Institutional Credit for Agriculture and Rural Development (CRAFICARD) under the Chairmanship of Sri B. Shivraman. The Committee in its interim report recommended the setting up of a National Bank, to be known as National Bank for Agriculture and Rural Development (NABARD) to give undivided attention to providing all kinds of production and investment credit to agriculture, small scale industries, village artisans, cottage and village industries, handicrafts and other economic activities in an integrated manner.

The NABARD was set up by merging the Agricultural Refinance and Development Corporation (an apex institution providing refinance and infrastructural support to commercial and cooperative banks) with the Agriculture Credit Department of the RBI which was previously directing the agriculture credit policy and providing refinance support to the rural banks. The NABARD started functioning from July 12, 1982.

In March 1980, all domestic SCBs were advised to raise the proportion of the priority sector advances from 33 1/3 per cent to 40 per cent of aggregate advances by March 1985. The recommendations made by the 'Working Group on the Role of Banks in Implementation of New 20-Point Programme' (Chairman: Ghosh, 1982) for the classification of the various segments that comprise the priority sector were accepted and instructions were issued to banks by the Government of India and RBI in February 1983. The various segments which were classified by the above Group's report under priority sector were Agriculture (both direct and indirect finance), Small Scale Industries, Small Road and Water Transport Operators, Retail Trade, Small

Business, Professional and Self Employed Persons, State sponsored schemes for Scheduled Castes/Scheduled Tribes, Education, Housing and Consumption.

Targets and sub-targets under the different priority sectors for different categories of banks have been reviewed and revised periodically. The sub-target for agriculture and allied activities which was set at 15 per cent of Net Bank Credit (NBC) to be achieved by March 1985 was subsequently raised to 16 per cent by March 1987, 17 per cent by March 1989 and 18 per cent by March 1990. In achieving this overall target, the banks were asked to ensure that their direct advances to agriculture should be at least 15 per cent of NBC by March 1985 and 16 per cent by March 1987.

1.3 Financial Sector Reforms and Agricultural Credit

India introduced the process of economic reforms in 1991 in response to the macro economic crisis that developed in early 1990s. The crisis was caused by rising inflation, high level fiscal deficit, low growth and unsustainable current account deficit, the Gulf war of 1990, and the balance of payments crisis. The major objectives of economic reforms were market orientation of the economy, increasing private sector initiative, improving efficiency in government spending, enhancing export competitiveness, foreign capital inflow, stabilizing balance of payment and revamping many sectors of the economy such as industry, trade, finance, infrastructure, etc.

Considering the strategic importance of the banking sector in economic development, Bhasin has come up with the observation that notwithstanding the remarkable progress made by the Indian banking system in achieving social goals during the 1980s, it experienced certain problems that led to decline in efficiency and productivity, and erosion of profitability. Factors such as directed investment and directed credit programmes affected the operational efficiency of the banking system. The quality of loan portfolio also deteriorated. The functional efficiency was affected due to over-staffing, inadequate progress in installing technology and weaknesses in internal organisational structure of the banks (Bhasin, 2006). Since the nationalisation of banks in 1969, the banking sector remained dominated by public sector banks with a significant quantum of non-performing assets. Credit was extended to the Government by mandating the maintenance of a minimum Cash Reserve Ratio (CRR)

and Statutory Liquidity Ratio (SLR) and whereby the commercial banks set aside substantial portions of their liabilities to investment in government securities at below market interest rates. This resulted in low profitability and poor asset quality. These factors necessitated urgent reforms in the financial system. Hence the Government decided to introduce the Banking sector reforms as a part of the comprehensive economic reforms in 1991 with a view to remove the institutional, technological and legal obstacles for the healthy growth of financial markets. It was undertaken with the prime objective to improve the efficiency in the process of financial intermediation, enhancing the effectiveness in the conduct of monetary policy and creating conditions for integration of the domestic financial sector with the global system. The reforms in the financial sector focused on enhancing the operational flexibility and functional autonomy of the financial sector with a view to promote efficiency, productivity and profitability as well as permitting the entry of new private sector banks.

The committee on Financial Systems 1991, commonly known as Narasimham Committee has gone through many aspects of priority sector lending to make financial sector more competitive, efficient, productive, profitable, and transparent. The main recommendations of the committee were reduction in SLR and CRR, deregulation of interest rates, abolishing licensing regarding the branch expansion, transparency in the guidelines or norms for entry and exit of private sector banks, phasing out the directed credit programmes and the concessional rates and introduction of prudential accounting norms relating to income recognition and assets classification. The committee suggested that the priority sector should be redefined and the targeted credit for priority sector should be brought down from 40 per cent to 10 per cent of total bank credit. Simultaneously, in order that banks could compete globally, it wanted major changes in capital adequacy norms and a new institutional structure that was market-driven and based on profitability as the prime criterion. The reform process helped in taking the management of the banking sector to the level, where the RBI ceased to micro-manage commercial banks and focused largely on the macro goals (RBI, 2005). The concept of Non-Performing Assets (NPAs) was introduced for the first time in the Narasimham Committee report 1991. The committee studied the prevailing financial system, identified its shortcomings and weaknesses and made various recommendations in order to make it more stable.

The agriculture sector had seen very little direct reform efforts though the rest of the economy has been undergoing reforms and restructuring. But the reforms in other sector have had an impact on the agriculture sector. The changes brought about in the monetary policy, banking policy, credit policy, exchange rate policy and the like have had different effects on agriculture sector. NABARD has promoted the concept of SHGs approach for financing the poor by formal institution and encourage the non-formal institutions and non-government organisations (NGOs) as well. A beginning was made in the year 1991-92 by linking SHGs with the formal credit agencies.

The sub-target for agriculture and allied activities under the different priority sectors for different categories of banks have been revised in October 1993. It was divided into a minimum of 13.5 per cent for direct loans and a maximum of 4.5 per cent for indirect loans.

In 1995-1996 the government announced the setting up of a Rural Infrastructure Development Fund (RIDF) in NABARD with contributions by commercial banks with shortfalls in their agricultural lending. These contributions were counted as the banks' indirect lending to agriculture. The fund was to assist state governments and state-owned corporations in speedy completion of on-going projects relating to minor and medium irrigation, soil conservation, watershed management and construction of rural infrastructure components such as rural roads and bridges, market yards, etc.

In order to review the progress in the reforms of the banking sector over the past six years with reference to the recommendations made by the Committee on Financial Systems in 1991 and to make necessary improvement, a committee on Banking Sector Reforms was set up under the Chairmanship of M. Narasimham in 1998. In this reform, greater emphasis was placed on structural measures and enhancement in the standard of disclosure and levels of transparency in order to align the Indian standards with best global practices and therefore prudential norms had been introduced gradually to meet international standards. The reforms chart out a programme for further reforms, necessary to strengthen India's financial system so as to make it internationally competitive due to the global changes occurring in the world economy, which made each industry very competitive.

An important initiative for universal access of farmers to institutional credit, the KCCS (Kisan Credit Card Scheme) was introduced in August, 1998. The scheme facilitated the farmers for easy and timely access to short-and medium-term loans for purchasing farm inputs while conducting seasonal agricultural operations for raising crops. The scheme is being implemented by the commercial banks, cooperative banks and RRBs.

"The Expert Committee on Rural Credit" (Chairman: V.S. Vyas, 2001) appointed by NABARD in the year 2000 recommended in its report dated July 23, 2001 that a review of the mandate of 18 per cent of credit outstanding for agricultural loans and 40 per cent for priority sector loans be made after five years, as it believed that Indian agriculture was likely to experience substantial, structural and other changes in this period of five years and the experiences of this period would provide a base for a more realistic reappraisal. The committee recommended that the maximum limit of 4.5 per cent of indirect credit should be maintained while reckoning the achievement of 18 per cent target for agricultural lending.

The Government of India announced a "Comprehensive credit policy" in June 2004, to double the flow of agricultural credit by all the financial institutions over a period of three years starting from 2004-05. It includes the commitment to raise agricultural credit flow by 30 per cent every year, financing of 100 farmers per branch (thus, 50 lakh farmers in a year), two to three new investments in agricultural projects per branch every year and a host of debt-relief measures, such as debt restructuring, one-time settlement and financial assistance to redeem loans from moneylenders (Ministry of Agriculture, 2007). Therefore, targets were set and the programme was implemented during the period 2004-05 to 2006-07. NABARD and RBI were vested with the responsibility of supervising the implementation of the programme. In 2003-04, total agricultural credit by all financial institutions stood at ₹ 86,981 crore. During the first year of the programme (2004-05), the institutional credit to agriculture was ₹1,25,309 crore which increased to ₹1,80,486 crore in 2005-06 and further rose to ₹2,03,297 crore in the last year of the programme (2006-07). Hence, the credit flow to farm sector doubled during two years as against the stipulated time period of three years.

In 2008-09, the government took note of the recommendations of the Radhakrishna Expert Group and announced a scheme of agricultural debt waiver and

debt relief for farmers. All agricultural loans disbursed by SCBs, RRBs and cooperative credit institutions up to March 31, 2007 and overdue as on December 31, 2007 was covered under the scheme. For marginal farmers (i.e., holding up to 1 hectare) and small farmers (1-2 hectare), there was a complete waiver of all loans that were overdue on December 31, 2007 and which remained unpaid until February 29, 2008. In respect of other farmers, there was a one-time settlement (OTS) scheme for all loans that were overdue on December 31, 2007 and which remained unpaid until February 29, 2008. Under the OTS, a rebate of 25 per cent will be given against payment of the balance of 75 per cent. The implementation of the debt waiver and debt relief scheme will be completed by June 30, 2008. Upon being granted debt waiver or signing an agreement for debt relief under the OTS, the farmer would be entitled to fresh agricultural loans from the banks in accordance with normal rules. Agricultural loans were restructured and rescheduled by banks in 2004 and 2006 through special packages. These rescheduled loans, and other loans rescheduled in the normal course as per RBI guidelines, will also be eligible either for a waiver or an OTS on the same pattern.

1.4 Organisation of Rural Credit

The agricultural credit can be obtained for different purposes from different sources under different terms and for different time periods. It can be classified according to the institution wise, purpose wise, period wise and security wise.

Indian farmers acquire their credit requirement from various sources which are broadly classified into institutional and non-institutional sources of credit. The institutional sources of agricultural credit include Cooperatives, Scheduled Commercial Banks and Regional Rural Banks, which are commonly known as multi-agency network(see Table 1.2). On the other hand, the non-institutional sources of agricultural credit comprises professional and agricultural moneylenders, landlords, traders, commission agents and the cultivator's relatives and friends and others who usually charge unreasonable rates of interest.

The flow of agricultural credit from the multi-agency networks consists of mainly two types viz., direct and indirect credit.The direct agricultural credit is given directly to the cultivators for farming operations and assets such as credit for crop production, land development and minor-irrigation development, purchasing animals,

farm machinery, implements and equipments, development of plantation, etc. The indirect agricultural credit advances to agencies engaged in the supply of production input and services to the agriculturists such as for financing PACS and distribution of farm inputs, financing state electricity board for energisation of pumping-sets, etc.

Table 1.2:Institutional Structure of Agricultural Credit in India(As on March 31, 2013)

<table>
<tr><td rowspan="6">Scheduled Commercial Banks</td><td colspan="2" rowspan="3">Public Sector Banks (26)</td><td>State Bank of India and Its Associates (5)</td></tr>
<tr><td>Nationalized Banks (19)</td></tr>
<tr><td>Other Public Sector Banks (1)</td></tr>
<tr><td colspan="2" rowspan="2">Private Sector Banks (20)</td><td>Old Private Sector Banks (13)</td></tr>
<tr><td>New Private Sector Banks (7)</td></tr>
<tr><td colspan="2">Regional Rural Banks (64)</td><td>Limited area of operation</td></tr>
<tr><td rowspan="5">Cooperative Banks</td><td rowspan="5">Rural Cooperatives (93,551)</td><td rowspan="3">Short-Term</td><td>State Cooperative Banks (31)</td></tr>
<tr><td>District Central Cooperative Banks (371)</td></tr>
<tr><td>Primary Agricultural Credit Societies (92,432)</td></tr>
<tr><td rowspan="2">Long-Term</td><td>State Cooperative Agriculture and Rural Development Banks (20)</td></tr>
<tr><td>Primary Cooperative Agriculture and Rural Development Banks (697)</td></tr>
</table>

Source: Department of Banking Operations and Development (DBOD) and Department of Economic and Policy Research (DEPR) 2013, Reserve Bank of India.

Purpose wise agricultural credit can be classified into two categories: (i) Productive and (ii) Unproductive. The loans which are used in productive operation of agriculture are called productive credit. It includes loans for the purchase of seeds, fertilisers, manures, agricultural implements, livestock, etc. The repayment of this loan by farmers is generally not difficult because the very process of production generally creates the income for repayment. On the other hand, there are personal reasons and other social obligations which includes performance of marriages, social

ceremonies on the birth or death of a family member, religious functions, festivals, etc, for which the credit is required and is known as unproductive. Besides it include credit for consumption purposes because in between the moment of marketing of agricultural produce and harvesting of next crop, there is a long interval of time and most of the farmers do not have sufficient income to sustain them through this period. Therefore, they have to take loans for meeting their consumption needs. In the time of droughts or floods, the crop is considerably damaged and farmers who otherwise avoid taking loans for consumption, have also to incur such loans.

According to period wise, it can be classified as short-term, medium-term and long-term credit. Short-term credit is for variable items of capital or seasonal inputs such as seeds, feed fodder for farm animals, fertilizers, fuel, pesticides, casual labour, etc. The loans are provided for a period of less than 15 months. Medium-term credit is for working capital assets such as machinery, diesel engines, wells, irrigation structures, threshers, crushers, bullocks, dairy animals and so on. The period is normally from a minimum of one year or more than 15 months to a maximum of 5 years. Long-term credit is for permanent land improvements, purchase of land and expensive agricultural equipments, soil conservation and for repayment of old debts. The loans are provided for a period of more than 5 years.

Security wise agricultural credit can be classified into secured and unsecured. Secured loans are those given on the basis of securities such as personal security of another person, mortgaging the property, hypothecation etc. Unsecured loans are those which are not based on security but given on personal security.

1.5 Objectives of the Study

The overall objective of the study is to evaluate the role of banking sector in agricultural finance during the post-reform period in India.

The specific objectives are:

1. To analyse the share (trends and composition) of institutional credit to agriculture sector during the post-reform period in India.
2. To examine the inter-regional variation in the disbursement of agriculture credit during the post-reform period in India.
3. To measure the credit gap among farmers across the size of land holding during the post-reform period in India.

4. To estimate the contributed share of institutional credit to agricultural production during the post-reform period in India.

1.6 Hypotheses of the Study

(i) Institutional credit to agriculture has no significant impact on agriculture sector during the post-reform period in India.

(ii) There is no inter-regional variation in agricultural credit during the post-reform period in India.

(iii) There is no credit gap among farmers across the size of land holding during the post-reform period in India.

(iv) The availability of institutional credit to agriculture has negative impact on agricultural gross domestic product during the post-reforms period in India.

1.7 Scope and Limitation of the Study

The study focuses attention on the contribution of institutional credit to agriculture sector at the regional level as well as at the all India level and its impact on the agricultural production. It throws light on the supply of institutional credit by different agencies like co-operatives, scheduled commercial banks and regional rural banks in the area of agricultural operation. The credit gap amongst the various sizes of land holdings will also be lighted. Hence the findings of the study would be useful to assess the nature of agricultural credit at all India level and regional level as well as among the size of land holdings. Besides, it would be helpful in policy-framing with regard to distribution of credit among different groups of farmers and regions for various agricultural purposes by different institutional agencies.

The analysis has covered macro aspects of the institutional credit to agriculture. On wider perspective the study explores the variables at all India level, while at the regional level the study is based on the six regions comprising of Northern, North-Eastern, Eastern, Central, Western and Southern region. The study is limited for the period from 1975-76 to 2009-10. The justification of selecting this period is that published data is available for up to this period only. For the purpose of analysis, the financial years namely, 1975-76 to 2009-10 has been treated as 1976 to 2010 respectively. This period has been divided into two sub-periods namely: (i) Pre-reform Period – 1975-76 to 1990-91 and (ii) Post-reform Period – 1991-92 to 2009-10.

The study will cover only crop production in 'agriculture' excluding other allied activities like diary, fishery, poultry, horticulture, etc. It does not include the functioning of non-institutional agencies such as money lenders, traders, relatives and friends, etc. It will exclude institutions like Agriculture Refinance and Development Corporation (ARDC), Agricultural Finance Corporation (AFC) and NABARD, which support the institutional credit structure in many ways but do not advance credit directly to farmers. Further it also excludes financing help which has been given by the Government as an agency like *taccavi* loans. The data since 1999-2000, covers not only the PACS but also the SCARDBs and PCARDBs of the long-term credit by cooperative societies, while the earlier period covered only PACS. The data of total outstanding credit (direct and indirect) excludes the data of Rural Electrification Corporation Ltd. (REC) of indirect outstanding credit.

1.8 Chapter Scheme

The entire study has been systematized by segmenting the facts and figures into various heads called different chapters, which are organized in a logical sequence. The study is arranged into five chapters which are as follows:

The opening chapter is that of the introduction of the study and it presents the importance and evolution of institutional finance to agriculture, financial sector reforms and agricultural credit, objectives, hypothesis, scope and limitations of the study.

Chapter two provides a review of related literature where views, opinions, observations and findings of different researchers (as found in different articles, journals, books, etc) on issues relevant to agricultural credit. This chapter will discuss on the performance and problems of institutional credit, and its inter-regional variation and credit gap amongst various sizes of land holdings in agriculture specifically after post-reform period. For the purpose of better understanding, the period of study has been divided into three distinct phases. The first phase will be from 1950 to 1969 when co-operative credit societies were the primary vehicle of institutional agricultural credit. The second phase will be from 1969 to1990 during which the nationalization of 20 major commercial banks was undertaken. The banks were henceforth assigned an important task of providing agricultural credit to supplement the credit provided by the co-operatives. In 1975, Regional Rural Banks

were established to provide credit to small and marginal farmers and weaker sections of society. And in the third phase, beginning with the financial sector reforms of the 1990s, emphasis was shifted in favour of prudential regulations and hencethe focus on social banking got diluted.

Chapter three discusses the locale of the study, sources and nature of data used, various statistical tools and techniques employed for analysing the data. It also provides the definitions of the terms and concepts that are used in the study.

The fourth chapter consists of the analysis on the trends and composition of different institutional credit to the agriculture during the pre and post-reform period in India. Here the inter-regional variations, credit gap amongst the size of land holdings and loans distribution of loans according to the credit limit size-classes by scheduled commercial banks during the reform-period is analysed. The study is sub-divided under the headings-

I. Trends in the Growth of Agricultural Credit wherein the trends in the growth of direct and indirect institutional credit to agricultural for the period 1975-76 to 2009-10; the share of direct short and long-term institutional credit to agriculture; the comparison of the trends prevalent during the post-reform period and the pre-reform period are examined.

II. Credit Flow to Agriculture: From Different Types of Credit Institutions under which the composition of different agencies of institutional credit to agriculture sector comprising the co-operative credit societies (the oldest credit agency amongst the multi-agency network established in 1904), the regional rural banks (established in 1975 for providing concessional credit to small and marginal farmers) and scheduled commercial banks (which lends direct and indirect credit to agriculture sector) is analysed.

III. Region-wise Distribution of Institutional Credit to Agriculture in which the estimation of the inter-regional variations in the supply of institutional credit to agriculture by scheduled commercial banks during the post-reform period (1992-2010) in all five regions of India (namely Northern, North-Eastern, Eastern, Central, Western and Southern) is studied. The growth rates for credit to agriculture for two sub-periods, viz., 1992-2000 (early post-reform period) and 2001-2010 (later post-reform period) are also analysed under this heading.

IV. Size-wise Distribution of Institutional Credit to Agriculture wherein the distribution of direct institutional credit (short and long-term) to farmers by scheduled commercial banks according to the size of land holdings during the post-reform period as well as distribution of institutional credit to agriculture (direct and indirect) according to credit limit size-classes of loans by scheduled commercial banks during the post-reform period will also be evaluated.

Fifth chapter describes the impact of financial sector reforms initiated in the early 1990son agricultural production. For assessing the impact of reforms the study will use Cobb-Douglas production function based on ordinary least squares method for pre and post-reform period. The variables used in the study are agricultural gross domestic product, institutional credit, gross sown area, gross irrigated area, agricultural labour force, consumptions of fertilizers and rainfall during the period of June to September. There are also other important variables (improved seeds, tractors, electricity, pesticides, etc.) which determined agricultural production but they can be purchased only with the availability of credit. The variables uses in the study have been collected from different secondary sources. The empirical results will focussed on the impact of availability of institutional credit on agricultural gross domestic product during the post-reform period.

The last chapter summarises the study, and discusses the conclusions and policy implications regarding improvement in the flow institutional credit to agriculture sector.

Chapter-2

Review of Literature

CHAPTER-2

REVIEW OF LITERATURE

In this chapter we have tried to review the available literature on institutional agricultural credit for discussing the performance and problems of institutional credit to agriculture, its inter-regional variation and credit gap amongst various sizes of land holdings in agriculture specifically after post-reform period. A brief review of agriculture credit since 1950 is also being given here. The study has been divided into three phases. The first phase is from 1950 to 1969 when co-operative credit societies were the primary vehicle of institutional agricultural credit. The second phase is from 1969-1990. During this period, the nationalization of 20 major commercial banks was undertaken. The banks were hence forth assigned an important task of providing agricultural credit to supplement the credit provided by the co-operatives. In 1975, Regional Rural Banks were established to provide credit to small and marginal farmers and weaker sections of society. In the third phase, beginning with the financial sector reforms of the 1990s, emphasis shifted in favour of prudential regulations, and the focus on social banking got diluted.

2.1 The First Phase (1950-51 to 1968-69)

The All India Rural Credit Survey (AIRCS) report was released in 1954 by the Gorwala Committee. The committee was appointed by the Reserve Bank of India which gave a new dimension to the entire cooperative rural credit structure. One of the important recommendations of the committee was that the Imperial Bank of India should be nationalized and designated as State Bank of India (SBI) and charged with special responsibility for expanding the coverage of rural credit. The survey further observed that agricultural credit as supplied by different agencies fell short of the right amount, not of right type and by the criterion of need often failed to reach the right people.

The report revealed that, despite the existence of co-operative credit societies for over 50 years, it accounted for only 3.1 per cent of the total borrowings of the cultivators whereas commercial banks accounted for a meager 0.9 per cent. Thus, the cultivators continued to depend on the non-institutional sources for more than 93 per cent of the estimated credit requirements in 1951-52 (Table 2.1).

Table 2.1: Relative Share of Borrowing of Cultivator Households from Different Sources in 1951-52

(Per cent)

Source of Credit	Non-Institutional, of which					Institutional, of which			Total
	Money Lenders	Relatives	Land-lords	Traders and Commission agents	Others	Govt	Co-operatives	Commercial Banks	
1951-52	69.7	14.2	1.5	5.5	1.8	3.3	3.1	0.9	100

Source: All India Rural Credit Survey, 1954

Amongst all the constituents of non-institutional sources, moneylenders held the predominant position. This was due to the fact that there was no other major source of institutional credit and the farmers were forced to borrow from moneylenders even at high rate of interest (Misra and Puri 2008).

Hira and Rajvir (1968) discuss the "Farmers' Attitude toward Use of Credit" and they found that the farmers turned to moneylenders mostly when they needed small sums urgently or because when they did not have enough security to borrow from credit co-operatives. The terms of repayment to moneylenders was more flexible and could be postponed in bad times even though they knew that the interest rate charged by them were very high. Besides, borrowing for unproductive purposes was also one of the factors responsible for dominance of moneylenders in rural credit. According to the results of the 8th Round Survey of the National Sample Organization (NSO) Report, in 1953-54, 70.71 per cent of operational holdings were of size-group below 2 hectares and covered only 16.79 per cent of the total operated area. The major part of the amount borrowed by small cultivators was mainly for meeting family expenditures or for the expenses of cultivation.

The AIRCS pointed out that the major portion of the loans from co-operatives went to the bigger agriculturists while the medium and small cultivators, constituting about 75 per cent of the total cultivators of the country, received only a tiny fraction. The committee summed up its findings in the celebrated dictum *"co-operation has failed, but co-operation must succeed."* Taking the importance of credit in achieving the targets on agricultural production into account, the committee recommended new

initiatives like state partnership at different levels and co-ordination between credit and other economic activities, especially processing and marketing. Further, it recommended the structural changes of co-operative agricultural credit societies to facilitate the credit requirement of farmers. The structural changes should be in the form that the state level co-operative credit institutions should consist of State Co-operative Bank, Central Land Mortgage Bank and State Co-operative Marketing Society in each State. The institutions of District Central Co-operative Bank, Primary Land Mortgage Bank and District Marketing Society should be formed at the district level. At the village level, Primary Agricultural Credit Societies and Large Area Multi Purpose Societies (LAMPS) should be formed for better allocation of agricultural credit.

The basic need of the small cultivator is for short-term credit, though occasionally he may need medium-term credit for buying plough, cattle or implements. Usually they do not opt for long-term credit because they do not have any security of tenure and absence of any tangible security to offer. Owing to the small sizes of their holdings and low productivity of agriculture, many small farmers do not produce enough to meet their consumption needs. In this context, Roy (2006) has pointed out that institutional credit is the major need of the day because it frees the cultivator from the clutches of moneylenders and enables him to obtain credit that is cheaper, systematized and productive. If the rural credit market is not adequately captured by the formal institutions, the natural beneficiaries would be the informal lenders (Rajeev and Deb, 1998).

In 1956-57, the Reserve Bank of India gave the General Review Report on the Rural Credit Follow-up Survey. The Survey indicates that as far as state partnership in management was concerned the steps taken by the Co-operative departments of State Governments were extremely inadequate. In November 1958, the National Development Council in its resolution on co-operative policy recommended that the responsibility and initiative for social and economic development at the village level should be placed fully on the village co-operative and the village panchayat. They were to be considered as the primary agencies for improving all aspects of rural life through the efforts of the people.

The RBI undertook a re-survey called the All-India Rural Debt and Investment Survey 1961-62, to assess the changes made since the Rural Credit Survey of 1951-

52. It pointed out that, over the period of 10 years, borrowings from the co-operatives had increased from 3.1 to 15.5 per cent but the private moneylenders still predominated. The survey further pointed that majority of the cultivators were borrowed for household expenditure which accounted for almost half of the total cultivators' borrowings from the co-operatives. Many a times the cultivators took new loans for securing ready cash for marriage and religious ceremonies. However there were some perennial weaknesses also, such as small membership, weak capital structure, inadequate loan operations, heavy over dues, failure to harness local savings and to promote thrift continued much as before.

Naidu (1968) found that the major drawback of co-operatives credit was considerable unevenness in the development of credit amongst the states. He further observed that in 1960-61, out of the total credit of ₹ 202.75 crore made available to the members by all agricultural credit societies in the country, 20 per cent was provided to Maharashtra, 15 per cent by Uttar Pradesh and 10 per cent each by Gujarat, Madras, Andhra Pradesh and Madhya Pradesh. The remaining nine states together contributed about 25 per cent of the total credit disbursed. Loans advanced per member were the highest at ₹ 277 in Gujarat, followed by Maharashtra, Madras, Mysore and Punjab. It was below ₹ 20 in Assam and Bihar.

Venkatappiah (1976) gave three important factors responsible for the changes that occurred between 1954 and 1969:

1. Agricultural technology had acquired a new dimension with the development of new varieties of seed which made possible multi-cropping on both medium and small farms besides large farms.
2. Agricultural prices had gone up. Farming seemed to be on the way to becoming a business. Larger production and higher prices implied more credit requirement and more insistence on the need for such credit.
3. The demand for credit was from a wide range of small and marginal farmers as well. This was due to the changes in technology which helped increase the productivity of the small farm and therefore the potential viability of the small farmer.

The other institution in the area of rural credit was Land Development banks which had not performed their role adequately as far as rural credit was concerned. In

this way a new dimension to the rural credit was occurred with the entry of the Agricultural Refinance Corporation (ARC) in 1963. This corporation was primarily a refinancing agency providing long-term accommodation to those agricultural development projects which cannot be financed by the existing credit agencies, that is, Central Land Development banks, State Co-operative banks and Scheduled commercial banks (SCBs). Areas so far not covered within the purview of the normal lending operations of the Land Development banks received particular attention and special schemes were drawn up by these banks for financing with assistance from the Corporation. ARC was to help in augmenting the resources available for provision of medium-term and long-term finance for agriculture.

2.2 The Second Phase (1968-69 to 1990-91)

During the 1950s and 1960s there had been a big industrial push with inadequate attention being given to the agriculture sector. However the drought in 1965-67 brought matters to a head and required concentrated attention to the agriculture sector (Mohan 2004). The Green Revolution during the late sixties, forced the need for providing adequate credit to the farmers that could enable them to purchase inputs such as fertilizers, high yielding varieties of seeds, pump sets for irrigation and so on. In this context Roy observed that credit would not only remove a financial constraint, but it might also accelerate the adoption of new technologies (Roy, 2006).

The Government of India introduced the scheme of Social Control over commercial banks in the early of 1968. Under this scheme the banks were expected to diversify bank credit more widely and extend credit to priority sectors like agriculture and small scale industry. This brought the commercial banks in the field of agricultural credit.

In October 1968, a study group was appointed under the chairmanship of Prof. D R Gadgil to determine the priorities of bank credit among various sectors of the economy of the National Credit Council (NCC)[1]. The study group found that out of the total institutional credit to agriculture sector i.e., 39 per cent, the share of commercial banks was meagre at 1 per cent which proved that the banking needs of

1 The National Credit Council was set up in 1968 to assess the demand for bank credit from various sectors of the economy and to determine their respective priorities in allocation.

the rural areas in general and backward areas in particular were not being taken care of by the commercial banks. Therefore, the study group in 1969 recommended the adoption of an 'Area Approach' for the development of credit and banking in the country on the basis of local conditions to bridge the spatial and structural credit gaps. It further suggested earmarking of the districts to commercial banks so that they could act as pace setters in the districts allotted to them in providing integrated banking facilities. The RBI accepted the recommendation and formulated the Lead Bank Scheme in December 1969, under which a bank was designated as the lead bank in a district. It was introduced to attain decentralization of rural credit down to the district level. The Lead bank was to act as a consortium leader for coordinating the efforts of all credit institutions in each of the allotted districts for expansion of branch banking facilities and for meeting the credit needs of the rural economy.

Besides this, in 1969 the report of the All India Rural Credit Review Committee was also released. It was set up by the RBI to make a comprehensive review of the co-operative movement in India. The committee concluded that the non-institutional sources still accounted for 81 per cent of agricultural credit in 1961-62 as against 93 per cent in 1951-52. The Committee noted that in spite of impressive quantitative growth at the All-India level, the co-operative credit system had made slower progress in several parts of the country such as Assam, Bihar, Orissa, West Bengal and Jammu and Kashmir.

The Committee opined that though the co-operatives were the pioneering institutions in agricultural credit and has increased their coverage in terms of area, number of farmers and quantum of loans since 1950, it is imperative to have other financial institutions to act as supporting agencies due to growing demand for institutional credit in the field of agriculture. Hence it recommended a multi-agency approach to rural credit.

The breakthrough in farm technology and adoption of new strategies in the mid-1960s, for sustaining the growth of agricultural production brought a tremendous spurt in the demand for credit by the farmers (Datey, 1976). Therefore, as Taylor *et al.*, (1986) has concluded that if credit is made available to facilitate the purchase of such modernized production inputs, the productivity, and hence incomes, of traditional farmers in developing countries will improve and the journey towards improved agricultural production processes will begin. As a result of the growing

demand of agricultural credit, in July 1969, fourteen major commercial banks were nationalized and 6 more in 1980. This brought a radical change in the policy and operations of agricultural credit mainly in two directions, one, multi-agency approach to agricultural credit and two, more finance to weaker sections of the community. One of the main objectives of bank nationalization was to embark on a branch expansion programme, particularly in the rural areas, with a view to carrying the banking habits to the underdeveloped and unbanked areas. These banks were convinced to the process of reducing regional imbalance and of affording adequate financial assistance to priority sectors (agriculture, small industries and exports) would be accelerated (Patel, 1976). Nationalized banks were able to pay the much needed attention to the credit needs of weaker sections, farmers, artisans and self-employed.

Bhasin (2006) discussed the banking development in India after independence and observed that the biggest achievement of nationalisation was the reallocation of sectoral credit in favour of agriculture, small scale industries and exports which formed the core of the priority sector. Within agriculture, credit for the procurement of food grains (food credit) was a major item. He found that after nationalisation there was a shift of emphasis from industry to agriculture.

Although in 1969, single agency approach had changed into multi-agency approach the commercial banks failed to fulfill the expectations because of the numerous problems faced by the agencies, like mobilization of savings, more cost, lack of trained personnel and unjust distribution, etc. (Lekhi and Singh, 1996). Therefore, with a view to provide guidance for helping the rural sector of the economy, a Banking Commission was appointed by the Government of India in February 1969 headed by Prof. A. M. Khusro, to study all the important aspects of the working of credit institutions in India. The report submitted in 1972, covers the entire field of institutional and functional aspects of the institutional credit to agricultural sector (co-operative banks, commercial banks, etc). It noted that although co-operative credit institutions were more widespread from the geographical viewpoint and has better knowledge of local conditions but the main problem was their organizational and financial weaknesses.

The important recommendation of the Commission in the field of co-operative was to create a new type of banking at the field level in the form of 'rural banks'. It would essentially be co-operative in nature and provide services of a much wider

range than are now offered by primary agricultural credit co-operatives. This brought the emphasis on providing alternative sources to provide credit to the weaker sections of the rural society.

The need for setting up of some kind of new institution of rural banks for providing rural credit and replace money lenders was again thought of after launching the 20 Point Economic Programme. Hence, the Government of India appointed a working group on Rural Banks headed by M. Narasimham Rao. It submitted its report in 1975, recommending the setting up of state sponsored region based, rural oriented commercial banks. It would blend with the rural touch, local feel, familiarity with rural problems and low cost profile which cooperatives possessed in a large degree. Hence the Regional Rural Banks (RRBs) were established in 1975. It was expected that this agency would combine the advantages of both the co-operatives and the commercial banks leaving out the disadvantages of both.

RBI appointed a committee under the chairmanship of M.L. Dantwala in 1977, to examine the working of Regional Rural Banks. The committee pointed out that the Regional Rural Banks can become a very useful component in the rural credit if some modifications in their organization and functioning are made. It further pointed that the programme for establishments of more RRBs should be accelerated. The committee was of the opinion that "the credit gap, both quantitative and qualitative, is so large that given a spirit of understanding both Regional Rural Banks and Central Cooperative Banks can function side by side without a clash of interest. This means that the most relevant criterion for the selective extension of RRBs is the state of the cooperative credit structure at the district level."

In March 1979, another committee was appointed by the RBI headed by Mr. Sivaraman for reviewing the institutional credit for agriculture and rural development, known as Committee to Review Arrangements for Institutional Credit for Agriculture and Rural Development. The final report was submitted in March 1981. The committee noted that commercial banks could play a significant role in the various programmes of rural development, and suggested measures to improve the quality of lending through these banks. It has recommended the setting up of a national level institution for providing all types of production and investment credit needs of agriculture and rural development. In pursuance of its recommendation, National Bank for Agriculture and Rural Development (NABARD) came into existence on

July 12, 1982. It was set up as a development bank with a mandate for providing and regulating credit and other facilities for the promotion and development of agriculture, small-scale industries, cottage and village industries, handicrafts and other rural crafts. It also had the mandate to support all other allied economic activities in rural areas, promote integrated and sustainable rural development and secure prosperity of rural areas (NABARD 2009). It took the agriculture credit functions of the Reserve Bank of India and refinance functions of the then Agricultural Refinance and Development Corporation (ARDC).

A working group was constituted by the Government of India under the chairmanship of S.M. Kelkar in 1984 for comprehensive review of the various aspects of RRBs functioning so as to find out ways and means for strengthening their organizational structure and improving their overall capabilities. It submitted its report in 1989. A number of recommendations were made in the report to improve the viability, operational efficiency and managerial effectiveness of RRBs. However the most important recommendation was for the continuance of RRBs but that they should not finance bigger borrowers and should retain their present image of a small man's bank. The loans should be advanced for the ultimate benefit of the borrowers falling in the target group of the RRBs so that the sense of local feel in the operations is not allowed to dilute. Viability of RRBs will have to be considered in terms of increase in business per branch, recovery rate, productivity of staff, cost-effectiveness of operations, closer monitoring and socio-economic upliftment and improvement in the standards of living of the clientele.

Regional Rural Banks and commercial banks have to be viable in the long run for the success of co-operative banks. It is imperative that they either raise the interest rates on lending or reduce cost of funds or reduce transaction costs or improve loan recoveries (Satish and Gopalakrishna 1997). Gadgil (1992) observed that during the decade 1975 to 1985, the formal agricultural credit system in India was characterized by a substantial quantitative growth but accompanied by deterioration in the quality of lending. There were many factors responsible for decline in the relative importance of co-operative credit. One such factor was directed lending for governmental programmes, such as Integrated Rural Development Programme (IRDP). The viability of the credit institutions was eroded due to rigidly regulated interest rates. Another important factor responsible for the malaise affecting the institutional credit system in

India during this decade was rising overdue. It was in this context that the Khusro Committee (Agricultural Credit Review Committee) was appointed in 1986. It was asked to review a wide range of aspects of the Indian agricultural credit system and make recommendations for improvement. The report was submitted in 1989.

According to the Committee, many of the major ills of the rural credit institutions have arisen on account of over administered rural banking system. It confirmed that a major weakness of the co-operative system has been the negligence of the base level institutions and the tendency of the higher level institutions to look after their own interests often at the cost of the primary co-operative credit society. The co-operative credit system woefully neglected its basic responsibility towards mobilizing deposits, with the lower tiers looking up to the higher tiers for refinance at all levels. Focusing on these drawbacks it recommended the creation of National Co-operative Bank at the national level to function as an apex institution. Its role was to provide leadership in banking operations to the state level institutions and operate as a balancing centre at the national level. It further recommended the continuance of directed lending for agriculture but suggested that concessional interest rates should be charged from the small and marginal farmers also and the interest rates on loans to other farmers within the ceiling of 15.5 per cent.

The Committee further noted that the performance of RRBs was not up to expectation. The most worrying aspect was erosion of their profitability. The major factors which contributed to this erosion was their lending exclusively to weaker sections, low interest rate margins and high operating cost involved in handling small loans with no scope for cross-subsidization. It suggested the merger of RRBs with commercial banks. This will offer a solution to the problem of insolvency and the in-built non-viability of the majority of RRBs.

For the commercial banks, it concluded that if they are to emerge as a strong system to be able to purvey credit effectively and efficiently in the rural areas, the targets for financing weaker sections and the rural poor should be reasonable.

2.3 The Third Phase (1990-91 to 2009-10)

In early 1991, a major economic crisis surfaced in India. The country faced high fiscal deficit, which was 6.6 per cent of gross domestic product (GDP), foreign exchange reserves dropped to levels which were not sufficient to finance imports of

even ten days and current account deficit at 3.69 per cent of GDP (Misra and Puri, 2008). Faced with such a crisis, India adopted reforms involving macroeconomic stabilization and structural adjustment programs. It aimed at improving economic performance and accelerating the rate of economic growth through a transition from an inward-looking strategy to an outward-looking one (Bhattacharya and Sivasubramanian, 2001).

Financial sector reforms were one of the comprehensive liberalization measures under taken in the structural reforms. The government of India appointed an expert committee-"Committee on Financial System (CFC)" chaired by M. Narasimham in 1991. The committee undertook the task of financial sector reform by placing emphasis on the steps needed to improve the financial health of banks and development of financial institutions to make them more viable and efficient so as to better serve the emerging needs of the real economy.

The major recommendations of the financial sector reforms were reduction in statutory liquidity ratio (SLR) and cash reserve ratio (CRR), abolition of branch licensing system for opening new bank branches, a step-up in the interest rates on deposits. It further recommended that directed credit to be abolished and banks should be given more autonomy, phasing out of concessional rate of interest rates applicable to priority sector lending. The priority sector targets for credit should be redefined to include only, small and marginal farmers, tiny industry, small business and transport operators, village and cottage industry, rural artisans and other weaker sections and refixation of credit target for this group at 10 per cent of aggregate bank credit. The dual control of RBI and Finance Ministry on banks should be abolished and RBI should function only as a regulatory authority of banking system in the economy, etc. In short, the Narasimham Committee recommended that banking policy be guided more by the market forces rather than by regulations of public authority. Regarding the cooperative banking or credit system the committee has not made any specific recommendations.

Many of the recommendations of the committee were not accepted. Sahu (2004) observed that the government did not favour the abolition of directed lending, delinking of the rural branches of public sector commercial banks and merging them into rural banking subsidiaries. It also did not accept the gradual deregulation of

lending rate and reducing priority sector target (retained it at 40 per cent of net bank credit).

However, despite the governments' reservations some of the recommendations were also accepted. They included various measures in the area of agricultural credit such as deregulation of interest rates of co-operatives, and RRBs; deregulation of lending rates of commercial banks for loans above Rs. 2 lakh; recapitalization of select RRBs; introduction of prudential accounting norms and provisioning requirements for all rural credit agencies; increased refinance support from RBI and capital contribution to NABARD; constitution of the Rural Infrastructure Development Fund in NABARD for infrastructure projects; introduction of Kisan Credit Card Scheme (KCCS) and stipulation of interest rate not exceeding 9 per cent for crop loans up to Rs. 50,000 extended by the public sector banks (Mohan, 2004).

2.3.1 Performance of Institutional Credit to Agriculture

Institutional credit to agriculture in India is purveyed by the multi-agency network comprising Scheduled Commercial banks (SCBs), Co-operative Banks and Regional Rural Banks. The policy of agricultural credit is guided mainly by the considerations of ensuring adequate and timely availability of credit at reasonable rates through the expansion of institutional framework. The focus in this section is to study some of the relevant literature related to the performance of these agencies.

Agarwal *et al.*, (1997) in their study focused on the gearing up of rural credit for the twenty-first century in India. The study was divided into two periods, 1973-75 and 1986-94. They concluded that the short-term credit to agriculture sector grew at a rate of 13 per cent during the period 1973-75 and a lower growth rate of 10.7 per cent during the second period of 1986-94. As far as long-term credit flow was concerned it showed a somewhat better growth rate at 17.5 per cent compared to the short-term credit flow in the first period. However its performance in the second period was less impressive. Out of the total short-term credit disbursed by the institutions in 1973-74, co-operatives accounted for about 87 per cent. But it declined to 60 per cent in 1994-95. During the same period, the share of commercial banks increased from 13 per cent to 34 per cent. Regional Rural Banks, which entered the business in mid-1970s, accounted for only 6 per cent of the disbursements and 7.8 per cent of the outstanding amount by 1994-95. Thus by 1994-95 co-operatives had a major share in the

disbursements of short-term credit. On the other side, Commercial banks emerged as major players in purveying term credit. They accounted for 55 per cent of the disbursements in 1994-95 compared to their share of 33 per cent in 1973-74 whereas co-operatives accounted for 39 per cent of the disbursements of term credit in 1994-95. Thus, commercial banks and co-operatives had attained distinct market shares in terms of the various types of credit. That is, commercial banks have major market share for long-term loans and co-operatives for short-term loans.

Bhattacharya and Sivasubramanian (2001) studied various aspects of banking sector reforms in India. They found that the share of agriculture in the total bank credit was rising, albeit with fluctuations, until 1990, when it reached a high level of 15 per cent. Thereafter, a steady decline was occurred and the share reached to a low of 10.6 per cent in 1998. During the period of 1970s, the agricultural sector witnessed higher rates of growth of bank credit (15 per cent) than the industrial sector (5.8 per cent) to the total rate of growth of bank credit. But this growth was declined during the period of 1980s and was 9.8 per cent. However, in 1990s, the rate of growth of credit to agriculture sector has considerably slowed down. It was only 0.5 per cent of the total bank credit whereas the industrial sector rate of growth of credit was 5.7 per cent.

Iqbal *et al.*, (2003) highlighted the impact of institutional credit on agricultural production in Pakistan. They suggested that in case of large-scale crop failure the farmers with good loan records must be extended consumption loans by the institutions. These loans may be granted in addition to the credit required for their farm operations. Moreover, a crop insurance scheme may be launched to provide cover to farmers against losses from drought, pest attacks, hailstorm, thunderstorm, heavy rains, and other natural hazards on payment of small premium in addition to credit mark up. They opined that agricultural credit card scheme should be initiated with generous credit limit (Kharif and Rabi seasons) for each farmer based on productivity of the land he/she is cultivating and other assets as collateral. At least 20-25 per cent of this limit may be allowed to him/her as consumption loan especially, during the bad years.

Mohan (2004) while analyzing the status, issues and future agenda of agriculture credit in India found that the overall flow of institutional credit to agriculture has increased after bank nationalization in 1969 and the role of informal

agencies including money lenders has declined over the years. There are several gaps in the system like inadequate provision of credit to small and marginal farmers, paucity of medium and long-term lending, limited deposit mobilization and heavy dependence on borrowed funds by major agricultural credit purveyors. All these have a major implication for agricultural development as also the well-being of the farming community. He emphasized efforts which are therefore required to address and rectify these issues.

Shetty (2004) evaluated the distributional issues in bank credit: multi-pronged strategy for correcting past neglect. He observed that the share of agriculture in total bank credit has steadily increased after bank nationalization and reached 18 per cent towards the end of 1980s. But thereafter the achievement has been almost completely reversed and the agriculture's credit share has dipped to less than 10 per cent in the late 1990s – a ratio that had prevailed in the early 1970s. Even the number of farm loan accounts with SCBs had declined in absolute terms from 27.74 million in March 1992 to 20.84 million in March 2003. To correct the past neglect of the agricultural credit he suggested that the flow of bank credit to agriculture has to be rapidly expanded. For this, some comprehensive and enduring strategy for credit delivery has to be put in place and the loss of momentum spawned by the neglect of developmental goals by banks now for over a decade has to be regained. He further suggested that it is necessary not to permit loan *melas* (fair) and banks must be told to work within the guidelines and directives issued to them regarding target to be met keeping in mind that if lending loans is their responsibility then recovering the loan is also their responsibility. For this to be effective a sound system of monitoring the banks' performance in regard to their credit delivery is required in the same rigorous manner as the monitoring of banks' prudential norms.

Ansari (2006) stated in his work on bank financing and agricultural development that after the nationalisation of SCBs in the country, the attention of banks shifted towards rural sectors in order to reduce regional imbalances and cater to various agricultural and non-agricultural credit requirements of farmers and other rural population. In subsequent years after nationalization, credit to agriculture sector has increased tremendously. During the period 1975-76 to 1980-81, credit to agriculture sector by all the agencies has increased by 52.4 per cent. In 1990-91, the agricultural credit was ₹ 8,846 crore, which registered an increase of 62.1 per cent

compared to the supply of agricultural credit in 1980-81. The flow of credit to agriculture by all agencies went up to ₹ 18,744 crore in 1994-95 i.e., an increase of 52.8 per cent within a span of three years. However, the total credit to agriculture sector in 1995-96, increased by 14.9 per cent, followed by 16.5 per cent in 1996-97, 17.3 per cent in 1997-98 and 13.3 per cent in 1998-99.

Roy (2006) attempted to estimate the flow of agricultural finance during the VII and VIII Five Year Plan (FYP)[2] period in India. The result revealed that in terms of total credit flow to agriculture, the share of co-operatives has increased from 53.1 percent in VII FYP period (1985-90) to 56.4 per cent in VIII FYP period (1992-97). However, the share of commercial banks to total credit flows to agriculture has declined from 41.5 per cent in the VII FYP period to 37.8 per cent in the VIII FYP period. On the other hand, the share of RRBs in the total credit flow to agriculture has increased marginally from 5.4 per cent in VII FYP period to 5.8 per cent in VIII FYP period.

Golait (2007) study was on current issues in agriculture credit in India. He observed that despite their wide network, co-operative banks, particularly since the 1990s have lost their dominant position to the commercial banks. The share of co-operative banks (22 per cent) during 2005-06 was less than half of what it was in 1992-93 (62 per cent), while the share of commercial banks has increased from 33 to 68 per cent, including RRBs 5 to 10 per cent, i.e., almost double during the above mentioned period.

Kumar, Singh and Kumar (2007) evaluated the performance of rural credit and factors affecting the choice of credit sources. They observed that one of the indicators of improvement in the rural credit delivery system was the reduction in the dependence of rural households on non-institutional sources of credit. The share of non-institutional sources in the rural credit had declined from 91 per cent in 1951 to 44 per cent in 1991-92. But the most dramatic achievement was increased in the share of formal credit institutions in rural credit from less than 9 per cent in 1951 to 56 per cent in 1991-92. Later on this trend seemed to stagnate and the role of exploitative

2 Five Year Plans (FYP) are centralized and integrated national economic programs. India launched its First FYP in 1951, immediately after independence under socialist influence of India's first Prime Minister Jawaharlal Nehru. Indian economy is based on the concept of planning. This is carried through her five-year plans, developed, executed and monitored by the Planning Commission.

sources of credit surfaced. The share of institutional sources in the total rural credit increased only slightly thereby to 57 per cent in 2002-03. They suggested that if immediate corrective measures are not undertaken, the situation may get worse in future.

Ramkumar and Chavan (2007) discussed the growth and the factors involved in agricultural credit while working on revival of agricultural credit in the 2000s. In their study, they infer that an increase in indirect finance is highly necessary for improving the capacity of farmers to absorb more direct finance. However, they caution that the promotion of indirect finance should not lead to the undermining of direct finance. According to them, about one-third of the increase in credit flow to agriculture in between 2000 to 2006 was a result of the increase in indirect finance. This did not originate from growth in traditional components of indirect finance, such as loan for the supply of input, power and credit to agriculture sectors. But was a result of definitional changes effected since the second half of 1990. The high growth rate of credit to agriculture in the 2000s was due to regular increase of credit in every year after 2000, and not just after 2004 {the United Progressive Alliance (UPA) government in 2004 announced its intent to double the flow of credit to agriculture over a period of three years}.

Shah *et al.*, (2007) evaluated the rural credit in 20th century in India and observed that the reforms has adversely impacted on the availability of affordable rural credit to the poor. Low interest rates, high transaction costs and low loan recovery rates, depress bank profits. As a result, the moneylenders made a definite comeback. Between 1977 and 1990, branch expansion exploded in unbanked regions, while declining in already banked locations. After 1990, exactly the opposite trend started to happen. Mergers and swapping of rural branches, rather than expansion, became the norm. The number of RRBs that rose to 196 by 1990 had fallen to 104 by 2006. It is clear that in the period of banking sector reforms, and relentless pursuit of profits, rural banks have forgotten what their primary mandate was and continues to be.

Patil (2008) examined the crisis and revival of agricultural indebtedness in India. The findings of the study revealed that after nationalization of banks the institutional credit for agriculture expanded from ₹ 1,865 crore in 1971-72 to ₹ 2, 03,296 crore in 2006-07. Yet the credit needs of the agriculture sector were not fully

met and a large number of Indian farmer households were still not able to borrow from the formal institutional system. Therefore, he suggested that the government should step in and provide a need-based financial support especially to the co-operatives credit and RRBs so as to cover cases where the farmers' ability to meet loan obligations has been affected severely owing to factors beyond their control. However he cautioned that though this support may be liberal, it should not be based on vividly defined conditions. He further stated that agricultural income in India is seasonal and cash flows are not continuous. All the farmers, big or small, face this problem. The banks should finance consumption requirements etc, liberally within the repaying capacity, to reduce farmers' dependence on moneylenders/traders etc. But in doing so the banking system needs to look at the cash flows of farmer households more carefully and link their financing to total cash flows of the family.

Deveraja (2011) analyzed the institutional finance and agricultural credit policy in India. He observed that Kisan Credit Card Scheme had emerged as the major policy developments in addressing the infirmities associated with the distributional aspects of credit in the recent years. It is the most effective mode of credit delivery to agriculture in terms of the timeliness, hassle-free operations as also adequacy of credit with minimum of transaction costs and documentation. Around 59.09 million KCCS were issued till end-March 2006. The co-operative banks (51.5 per cent) had a major share followed by commercial banks (36.9 per cent) and RRBs (11.6 per cent).

2.3.2 Problems of Institutional Credit to Agriculture

Credit is not only one of the important inputs in agriculture but also an effective means of rural development. One of the objectives of the credit policy has been minimize the role of non-institutional sources, mainly the moneylenders in the flow of agricultural credit. The farmers in India faces many problems in repaying the debt due to high risk involved in the agricultural productivity (because of seasonal and annual fluctuations), no other sources of income, high transaction costs, unskilled staff, complicated lending procedures, low recovery rate, etc. Here various international studies have been undertaken to throw some light on the related literature about the problems of agricultural credit.

Shrestha (1992) estimates the impacts of institutional credit on the growth of the agricultural sector in the Nepal economy. He concluded that institutional credit programs used in Nepal as well as in many other less-developed countries have excluded deposit services and consumption lending from their activities. The deposit services are generally viewed to encourage rural savings and increase the supply of loanable funds. Many farmers need consumption credits as much as or even more than production credits, hence institutional sources for consumption credits along with production credits, at low transaction costs and flexible repayment terms, would relieve farm households in less-developed countries from the clutches of exploitative private moneylenders and would thereby reduce possible misuse of production credits.

In his study on the role of the State on financial market, Stiglitz (1993) observes that there will be some potential borrowers who will be unable to get the credit even if they want to pay higher than the market rate due to the presence of asymmetric information. Therefore, he infers, the government intervention in the financial market will help this market to function better as well as also improve the performance of the economy.

Swinnen and Gow (1999) in their study on agricultural credit problems and policies during the transition to a market economy in Central and Eastern Europe found that the low farm profitability is a key factor in agricultural and rural finance problems, restricting the demand for, and supply of, credit in transitional economies. Hence, interventions solely aimed at correcting the inefficiencies of rural financial markets may not be sufficient to stimulate a flow of financial resources into the agricultural sector unless profitability improves and restructuring progresses as well. Further they noted that credit is improving in some transition countries primarily due to two factors, namely, the improved profitability in agriculture since 1995 and the emergence of institutional innovations, such as leasing, contracting, etc. The finance situation remains most problematic only in those countries which have postponed reforms and have continued to use the banks to channel subsidized credits and loans to the large scale farms with heavy government discretion in loan allocation and widespread use of state guarantees. The result has been low repayment, reduced incentives for farm restructuring, accumulation of bad debts, government budget deficits and in some cases, collapse of the agricultural banks.

Ishige (2004) in his report on measures for enhancing efficiency in the delivery of agricultural support services in Japan for agricultural credit observed that loans to agriculture sector especially to the active farmers with excellent entrepreneurship spirit were insufficient. As a result, the number of part-time farmers increased and enlargement of farmland per farmer might not have been well achieved. Also, many farmers faced heavy debt problems basically caused by their over investments in the past.

Llanto (2007) observed in his article that a large number of subsidized agricultural credit programs have collapsed in both Asia and Latin America. In the case of the three Latin American countries i.e., Guatemala, Peru and Bolivia, the government banks that were used to channel subsidized credit to target clientele were unable to sustain financial losses brought about by the non-repayment of loans and had to close down. The infusion of artificially cheap credit weakened banking systems, imposed huge fiscal burdens on the governments, and eroded the financial discipline of rural borrowers. This forced governments to rethink their rural credit policy and programs.

Oboh and Ekpedu (2011) attempted to evaluate the determinants of formal agricultural credit allocation to the farm sector by arable crop farmers in Nigeria. They observed that the factors that significantly affected the rate of credit allocation to the farm were farmers' age, educational level, farm and household size. Other factors were length of loan delay and visit to farmers by bank officials. Further, they suggested that in order to reduce the rate of loan diversion towards non-farm sector, loans should be disbursed on time, and bank supervisors should visit beneficiaries regularly. In addition, pre-disbursement training is recommended for all successful loan applicants for efficient loan allocation and management.

Various other studies are also made in Indian context to understand the related literature about the problems of agricultural credit.

Rajasekhar and Vyasulu (1990) evaluated the rural credit delivery system in Pali district of Rajasthan and they found that some of the rural poor obtained agricultural credit from the institutional sources but they found that the credit was neither timely nor adequate for their credit needs.

Rao (1994) in his study policy issues relating to rural credit in India observed that the asset position of a borrower and the rate of interest at which he gets a loan are inversely related. On this ground the asset-poor sections of the rural population is still dependent on the informal sources of credit. Further he found that the agricultural lending rates set by the government were lower than the commercial and industrial rates. Therefore, commercial banks could not cover the cost of their advances of agricultural loans which led to the cross-subsidisation of agricultural operations. He raised the policy issues relating to the viability of credit institutions, equitable access to credit, redefinition of priority sector, and enhanced role of rural banking institutions to cope with the emerging challenges.

Rajeev and Deb (1998) attempted to evaluate the flow of institutional and non-institutional credit to agriculture in Hugli district of West Bengal. The finding of the study stated that if the rural credit market is not adequately captured by the formal institutions, the natural beneficiaries would be the informal lenders. Commercial banks are mainly guided by two objectives: minimization of transaction costs and meeting the stipulated target of priority sector lending. These two motives induce them to prefer big farmers and go in for other kinds of priority sector lending which they perceive to be profitable. When a farmer opts for multiple cropping it is difficult to repay his previous loan for another crop in the same year and hence he is compelled to depend on the informal sector. Thus, a small farmer may have to borrow a higher amount than is actually needed by him. The study further revealed that any perception, about waiving a loan in future has adverse effect on today's incentive to repay.

Karla and Singh (2000) discussed regional rural banks economic viability and equity issues in financial institutional reforms in Punjab. They attempted to examine the causes of limited access of the rural poor to the institutional credit. According to them, the institutional agencies, keeping in view of the asymmetric information on the borrowers, base their lending decision on size and composition of borrowers' wealth. In spite of the various measures and reforms introduced in the banking sector such as mandating the funding to agriculture sector, it continues to be alleged that the benefits of the institutional credit expansion have largely accrued to the well-off farmers and a majority of the rural poor have remained outside the institutional network. Thus, they

believe that reformation in the institutional credit system for rural areas is necessary and of utmost concern. So, they suggested that improving the access of the rural poor to the institutional credit as one of the solutions to bring about the reduction in rural poverty and inequality.

Bhattacharya and Sivasubramanian (2001) examined the aspects of banking sector reforms in India. The study concluded that although the overall rate of growth of bank credit has slowed down in the post-reform period, the contraction has been felt mostly in the agricultural sector. The industrial sector has been relatively immune from the impact of the decline in the rate of credit expansion. They believed that part of the reason for the industrial sector getting a larger share of the bank credit is due to the banks' perception that the loans to the industrial sector are less risky than those to the agricultural sector.

Chattopadhayay and Chattopadhyay (2002) during their study on non-performing assets in rural lending institutions revealed that the institutionalization of rural finance was one of the major attempts made to substitute non-formal lending. They observed that still the organizations and functions of the rural finance institutions had not equaled to the organizations and finance of the rural moneylenders in respect of efficiency. This is because the moneylenders are expert in agrarian matters such as the knowledge of crops, climate, soil and entrepreneurship of the borrower viability, which routine-driven formal organizations can obtain not only at great cost but also with great devotion to duty. Further, they concluded that the credit to agriculture had not been productive particularly for the lack of infrastructural facilities and entrepreneurial development.

Samal (2002) study was on the revisited institutional credit flow to West Bengal agriculture. He revealed that the access of small and marginal farmers to credit was limited due to several institutional and non-institutional factors which he broadly divided into supply and demand side factors. The supply side factors included ground level credit planning (study found that more than 87 per cent of the bank branches are not followed), loan default (government sponsored programmes has 70 to 80 per cent default rate by study), inadequacy of skilled and dedicated manpower for rural credit delivery (75 per cent by study), and lack of infrastructure and political interference in lending decision. On the demand side factors he included, needed for repeated visits to bank branches for agricultural loans, delay in sanction and disbursal of loans, non-

disbursal of crop loan in cash, rigid loan products, lack of access to the branch managers and inadequate credit supply. To overcome this problem he suggested a supplementary credits route i.e., the setting up of Micro Finance Institution (MFI) / Self Help Groups (SHGs) and linking them with formal credit agencies. This approach will tackle the roots of the twin problems, namely, high transaction cost and poor repayment of loans which have made the rural credit delivery system moribund. In the state of West Bengal where agriculture is totally dominated by the small and marginal farmers, SHGs route is most suited for credit delivery. It would help to mobilize rural savings, empower the small and marginal farmers to negotiate production and investment loans, reduce transaction cost and improve loan recoveries.

Shetty (2004) has analysed the distributional issues in bank credit: multi-pronged strategy for correcting past neglect. He found that a real cause for banks' lending's to agriculture has been the banks' professional reluctance towards expanding their branch network in rural areas. The number of bank branches operating in rural areas (classified uniformly on the basis of the 1991 Census) has experienced an absolute reduction from 33,017 (or 51.7 per cent of the total) in March 1995 to 32,283 (47.4 per cent of the total) in March 2003. Given the option, the SCBs would not like to operate in rural areas. This has happened because no attempt has been made by the authorities to substitute it by strengthening cooperatives and RRBs or to build an alternative rural institutional structure for credit delivery. In this case he suggested that it is necessary to launch a medium-term strategy for effectively expanding the flow of farm credit. For the first and foremost he emphasized on the need for further spreading of branch network by SCBs and RRBs, secondly, to reinforce close coordination between district planning authorities and banking institutions operating in a district and finally, to modify the nature of expectations of profitability of rural branches.

Singh (2004) examined the rural banking in India with special reference to Avadh Gramin bank. He observed that the demand for rural credit had all along been growing during the planning era due to the adoption of modern methods of farming. The agriculture operations were required larger amount of capital both short-term for the purchase of inputs like chemical fertilizers, High Yielding Varieties of seeds, pesticides, etc., and medium as well as long-term funds for mechanization and land

development, etc. For this he suggested that there should be rapid expansion of rural branches so that rural credit should be expanded.

Ghosh (2005) while analyzing the policy approach for agricultural lending found that in agricultural lending, the resource cost for delivery and monitoring of credit is very high and the banks have not yet found an easy answer to managing the costs of credit delivery and supervision in the agricultural sector within the discipline of balance sheet numbers. He further stated that the problem lies with bank managements, namely, that bank officers are not familiar to rural lending and has to undergo an attitudinal change. They have to develop a kind of defensive inertia that refuses to take note of the growing needs of farmers, that the fear of protection in the event of default has generated a frustratingly negative psychology, that the procedures and practices that they have developed have an in-built bias towards under-lending to the farm sector. For this he suggested that public sector banks have to do more in this area as they have done in other segments of lending. They have to look closely at their business processing costs in relation to credit delivery and supervision aspects of agricultural lending. They must innovate in every conceivable way to give a renewed thrust to agricultural lending at a sustainable cost. So some autonomy and flexibility in their operations will increase their efficiency.

Sahu and Rajashekhar (2005) while analyzing the banking sector reform and credit flow to Indian agriculture found that the share of those farmers who borrow less than ₹ 25,000 cause a decrease not only in the total numbers of loan accounts but also in the total amount of loan during the reform period. This trend became more prominent after the deregulation of the lending rate to ultimate borrowers which had an adverse effect on the small borrowers' access to formal credit. Thus, the better-off farmers had more advantage of access to formal credit as compared to marginal farmers. Further they pointed out that the decline in the number of rural bank branches and increasing population pressure in rural areas may have resulted in many problems. These problems were in the form of reduction in the credit flow to agriculture, reduction in the access to a banking facility by the rural population, growth of the private investment for agriculture and financial deepening of the rural population may have come down and loan demand and deposit supply may have been adversely affected.

Ansari (2006) in his evaluation of bank financing and agricultural development observed that the farmers approaching a second-time for agricultural credit from private sources are common but with banks it is different. It often depends on the approach of both the borrower and the banks. He found that the farmers often avoided borrowing the second time from the banks due to many reasons such as high rate of interest on loan, time-taking procedures, attitude of bankers, fear of becoming defaulters, harassment, etc.

Roy (2006) evaluated the rural banking and agricultural finance in India. He observed that in spite of the significant expansion of the institutional sector, non-institutional agencies still continue to play a dominant role, although these agencies charge higher rates of interest and follow unethical practices. They dominant the scene because the farmers find it more convenient to resort to them rather than the agencies in the organized sector. The main reason for this is that their lending procedures are relatively simple and credit assistance timely. Hench he argued for microfinance programmes as important institutional devices for providing small credit to the rural poor. Micro-financing programmes through SHGs, introduced and expanded by NGOs in several parts of India, have the potential to minimize the problem of inadequate access of banking services to the poor. The programme is financially viable for banks as their transaction costs are lowered and with close to 98 % loan recovery. Saving of the group constitute the collateral with peer pressure within the SHGs ensuring full recovery. The SHG-Bank Linkage model has been able to completely alter the socio-economic face of rural India.

Golait (2007) made an analysis on current issues in agriculture credit in India. The study concluded that despite the significance strides achieved in terms of spread, network and outreach of rural financial institutions, the quantum of flow of financial resources to agriculture continues to be inadequate. The flow of institutional credit to agriculture is constrained by host of factors such as high transaction costs, structural deficiencies in the rural credit delivery system, issues relating to credit worthiness, lack of collaterals in view of low asset base of farmers, low volume of loans with associated higher risks, high man power requirements, etc. The small and marginal farmers which is having major share in the land holdings received much less credit than its requirement. He recommended several measures to tackle this situation which includes improvement irrigation coverage, promotion of animal husbandry as an

alternate source of income, better accessibility to institutional credit and overall improvement of the marketing infrastructure. Since the access of small and marginal farmers to credit has been constrained by their inability to offer the collaterals, micro finance, which works on social collaterals, can go a long way in catching to their requirements. The KCCS has emerged as the most effective mode of credit delivery to agriculture in terms of the timeliness, hassle-free operations as also adequacy of credit with minimum of transaction costs and documentation. Hence, there is need to promote micro finance and KCCS more vigorously on a widespread basis.

Sidhu and Gill (2006) conducted a detailed work on agricultural credit and indebtedness in India. The finding of the study revealed that the important factors that hinder the access of disadvantaged sections of the rural society to institutional credit were higher transaction cost due to large numbers and small borrowings, higher risk cost, complicated procedures and large documentation required, inability of the borrowers to provide tangible collaterals, non-availability of tenancy agreements, loan waivers which affects recovery performance, poor risk mitigation mechanism on farms in the wake of crop failures and the mindset of the bankers against small loans viewing them as unprofitable.

Deb and Rajeev (2007) made an analysis of banking on '*Baniyas*'[3] for credit in West Bengal. They revealed that with the improvement of agricultural production and productivity, leading to an increased demand for credit, the small and marginal farmers in West Bengal are depending on a new class of lenders for their working capital. They are the input traders who have almost replaced the traditional moneylenders in the rural sector. This class makes credit available in terms of inputs on a timely basis and more importantly without any formal collateral. They do not charge a too high interest rate like some other classes of lenders (for example, traditional moneylenders). Credit is usually not in terms of cash but in terms of inputs that need to be repaid after harvest in terms of cash or kind (output). Further the study observed that timely repayment of credit from the formal sector does not necessarily ensure fresh credit to the following year and transaction costs remain high for marginal farmers for availing formal sector loan. The belief of the farmers that if a

3 '*Baniyas*' are the indigenous banker group or association of people involved in indigenous banking. They provide loans on the basis of promissory notes for productive purposes and are also involved in mobilizing savings by people.

loan is not paid back, the government will eventually waive it, adds to the high default rate.

Ramkumar and Chavan (2007) made an analysis of revival of agricultural credit in the 2000s. He found that the trends that emerged in India in the 1990s with respect to the supply of rural credit in general and agriculture credit in particular, were disturbing. There were many factors responsible for this i.e., the large-scale closure of commercial bank branches in rural areas, sharp fall in the growth of credit flow to agriculture, increased sidelining of small and marginal farmers in the supply of agricultural credit, increased exclusion of the disadvantaged and dispossessed sections of the population from the formal financial system, strengthening of the hold of moneylenders on rural debt portfolios, widening of inter-state inequalities in credit provision and a fall in the proportion of bank credit directed towards regions where banking was historically underdeveloped.

Satish (2007) in his study on agricultural credit in the post-reform era: A target of systematic policy coarctation found that the rural branch network saw a tremendous growth following the nationalisation of banks in 1969 and the establishment of Regional Rural Banks in 1975. The percentage of growth of commercial banks' rural branches which was 17.2 per cent in 1969 steadily increased to 58.2 per cent in 1990. Since then, the growth declines progressively as the RBI liberalized the policy for the closure of rural branches on the grounds of unviability and lack of profitability. In terms of percentage, the growth declined from 58.2 in 1989-90 to 51.7 in 1994-95 and further to 44.48 in 2005-06. As a solution, he suggested that RRBs should come forward upon their own and play a greater role in agricultural credit under the overall guidance and advice of NABARD. For this, the RRBs have to emerge as independent institutions and also expand their operations and at the same time, step-in into the areas where co-operatives are weakened. He, further observes that commercial banks' dismal performance in purveying agricultural credit due to insufficient supervision of RBI which is from lack of knowledge about agriculture as well as agricultural credit can be rectified only by handing over the entire supervisory responsibilities of rural branch network of commercial banks to NABARD, which would ensure a better and systematic monitoring and supervision of flow of credit and other financial services to agriculture on account of its deep understanding and knowledge of the sector and strong field level presence.

Shah and *et al.*, (2007) overviewed the history and perspective of rural credit in 20th century in India. They observed that rural credit is not merely a commodity that is necessary for the poor to free them from the usurious moneylenders but also a public good significant for the development of a backward agrarian economy like India. It is also because of the fact that Indian agriculture had moved decisively into the green revolution phase, where private investments by rich farmers needed massive support. Further they argued for the need of a package of change which includes massive increase of public investment in agriculture and rural infrastructure, market support for crops grown in rainfed areas, reforms in public sector banking (including RRBs), reforms of the co-operative credit structure, strengthening the SHG-Bank Linkage Programme with the state (especially NABARD) bearing promotional costs in the initial years and strict public vigilance, including maximum permissible interest rate bands, on the functioning of MFIs. They pointed out that with the advent of economic reforms access of the rural poor to banks has fallen further. In such a context microfinance offers a new ray of hope to the rural poor. It makes finance accessible and available for consumption needs as well as freedom from the need for collateral which makes it more attractive to the rural poor. The microfinance institution apparently brings great professionalism, innovation and technology to its enterprise. It also ventures to provide loans that banks do not.

Patil (2008) study on the crisis and revival of agricultural indebtedness in India and revealed that the services rendered by the formal institutions are poor in quality because of the inadequately employed branches operating under a mandatory rural branch posting policy with a short-term stay. This gives little time to the staff to develop proper knowledge about the area and the people. Hence, this source of financing is not reliable as the approval of loan takes quite long time, an average of 33 weeks. So, he suggested that a change is needed made in the mind-set of the staffs of the banks and also in their policies so that they work for financial inclusion rather than financial exclusion which has been practicing so far.

Singh *et al.*, (2008) while analyzing the indebtedness among farmers in Punjab found that the advances from institutional sources increased more than three times in real terms since the 1990s but till now, it could not completely eliminate the borrowing from the non-institutional sources by the farmers. It is primarily because credit from institutional sources is fraught with many inadequacies such as amount,

easiness, timeliness and other strings of formalities/procedures attached to it. Besides the farmers have to make many trips to complete formalities required for obtaining institutional loans and spend extra money other than the interest charged by these agencies. All this is approximately negligible in the case of non-institutional sources and hence they noted that institutional lending is inadequate, costly and cumbersome and farmers have to resort to private non-institutional sources of finance, which have their own ways to exploit and squeeze the farmers' net incomes.

The NABARD (The Economic Times, 2011) pointed out that sponsoring banks are running their branches in the same areas where RRBs are operating. Hence, instead of co-operation, there develops a competition which acts against RRBs, hindering their performance and progress. They suggested that "roping in any other financial institution or tapping the capital markets is the only option left for RRBs if they need to play a larger role in financial inclusion".

2.3.3 Inter-region Variations in Agricultural Credit

The present study has been undertaken to identify the factors influencing a variation in agricultural credit flow to various regions and states in India. Variations in the flow of agricultural credit across regions and state have generally been explained by the regions or state's share in gross cropped area, irrigation facilities, and fertilizer consumption. Due to the vastness in number of states and different cropping pattern the related review of literature divides the country in major regions and states.

Mohan (2004) while discussing the status, issues and future agenda of agriculture credit in India observed that the southern states stand out with a substantially higher share of agricultural credit followed by the Northern and Central regions. Whereas the ratio for the southern region increased during the latter part of the 1990s, it remained stationery for the Northern, Central and North-Eastern regions. It is also notable that the Southern states have a much more active co-operative movement and hence their share of agriculture credit is likely to be even higher. The low share of the Western region is surprising, but could be because of the very active role of co-operatives in this region. The East and North-Eastern regions clearly get a very low share.

Sahu (2004) while analyzing the institutional finance for agriculture found that the growth rate of agricultural credit in 14 major states {Andhra Pradesh, Bihar (undivided), Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh (undivided), Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh (undivided), and West Bengal was higher during the pre-reform period compared to the post-reform period in most of the states. The study observed that, the state-wise pattern in the proportion of agricultural credit from net bank credit declined in most of the states during 1981-90. The decline was also common for all the states during 1990s. The substantial inter-state differences in agricultural credit as a proportion to total net bank credit shows that there was less mobilization of deposits for agricultural lending by scheduled commercial banks particularly the case in backward states like Bihar, Uttar Pradesh, and West Bengal.

Sidhu and Gill (2006) conducted a study on agricultural credit and indebtedness in India. The finding of the study revealed that there were wide variations in the availability of institutional credit per hectare of gross cropped area in different states. The flow was as high as ₹ 6,235 in Kerala, ₹ 5,502 in Tamil Nadu, ₹ 3,806 in Punjab and ₹ 3,428 in Andhra Pradesh while it was as low as ₹ 873 in Uttar Pradesh, ₹ 432 in West Bengal and only ₹ 155 per hectare of gross cropped area in Bihar in 1999-2000. The accessibility to institutional credit is higher in the Southern region while it is very poor in the North-Eastern region. The Southern states with only 19 per cent of the gross cropped area of the country accessed about 44 per cent of the total disbursals whereas Central states accounted for 27 per cent of the area were obtained only 14 per cent share of total disbursals at all India level in 2001-02. Further, they also found that the annual increase in the availability of credit also varied widely across states. It was only 3 per cent in Orissa whereas it was 47.5 per cent in Punjab from 1990-91 to 2000-01 accentuating the disparity in agricultural credit further in favour of irrigated, technologically advanced and agriculturally more developed regions.

Golait (2007) during his study on current issues in agriculture credit in India found that there were wide variations in the availability of institutional credit per hectare of gross cropped area in different states. It was as high as ₹ 9,403 in Tamil Naidu, ₹ 7,666 in Kerala, ₹ 5, 352 in Punjab and ₹ 4, 604 in Andhra Pradesh, while it was as low as ₹ 311 in Assam, ₹ 667 in Rajasthan and ₹ 698 per hectare of gross

cropped area in Madhya Pradesh during 2001-02. The accessibility to institutional credit is higher in the Southern region where the level of agricultural development is also higher.

Khan *et al.,* (2007) attempted to evaluate the effect of liberalization on institutional agricultural credit flow and its relationship with average cost of cultivation in Indian agriculture. The findings of the study revealed that the magnitude of coefficient of variation (CV) for inter-state variations in the per hectare flow of short-term institutional credit to agriculture was 83.4 per cent in 1980-81, which increased gradually to 124.8 per cent in 1985-86 and further to 135.92 per cent in 1990-91. In the post-liberalization period, the magnitude of CV, which was 139.3 per cent in 1991-92, declined to 130.5 per cent in 1995-96 and further to 91.3 per cent in 2001-02. Thus, during the pre-liberalization period, the inter-state disparities in the flow of short-term institutional credit to agriculture has increased across the states but the opposite was happening during the post-liberalization period. They suggested that for equitable and sustainable growth and development of agriculture across different regions of the country, different institutional agricultural credit agencies within multi-agency system need to refocus their attention on disbursement of short-term credit to agriculture through proper coordination so that inter-regional disparities could be further reduced.

Kumar, Singh and Kumar (2007) attempted to evaluate the performance of rural credit and factors affecting the choice of credit sources. They observed that the focus of the financial reforms initiated in 1991 seemed to have bypassed the rural credit needs and left the rural people vulnerable to exploitative credit. The performance and trends were not uniform across different states. The borrowing had witnessed higher growth rates from both institutional and non-institutional sources in relatively more developed agricultural states. The Southern region of the country availed higher amount of rural credit, followed by the Northern, Western and Central regions. The credit availability from the institutional sources was abysmally low in the economically backward states like Bihar and North Eastern states. Accessibility to institutional credit was higher in the developed states and lower in the backward states, which had been accentuating over time. The annual increase in the availability of credit from institutional sources also varied across the states. It was only 4 per cent

in Bihar, 16 per cent in Punjab and 22 per cent in Kerala. They argued that if immediate corrective measures are not taken, the situation may even worsen in future.

Sahu (2007) attempted to analyze the supply of institutional credit to agriculture for major states in India. The study revealed that states like Bihar, Rajasthan, West Bengal, Kerala, Karnataka and Maharashtra, the growth rate of credit to agriculture was higher than that to all sectors during the period 1981-91. However, the growth rates of agricultural credit were much lower than those in the case of total credit for all the states during the period 1992-2000. The decline in growth rates was steep in the case of agricultural credit, especially in the case of Bihar, West Bengal and Gujarat. For high income group states (Gujarat, Haryana, Maharashtra and Punjab), although the growth rate of credit to all sectors increase during 1992-2000, but it decreased in the case of agriculture. Thus, the growth rates of agricultural credit were uneven across the sub-periods as well as across the states. There was perceptible change in the level of credit provided to agriculture during the 1990s. First, the priority sector norms in relation to agricultural lending were met in nine and eight states during 1991-95 and 1996-2000, respectively. Second, the norms were met in all the low-income states (Bihar, Madhya Pradesh, Orissa, Rajasthan and Uttar Pradesh) and a few high and middle-income states (Andhra Pradesh, Karnataka, Kerala, Tamil Nadu and West Bengal) during 1996-2000. Third, in the case of West Bengal and Maharashtra, the priority sector norms were not met even during both pre-and reform periods.

Kumar *et al.*, (2010) while analyzing the status, performance and determinants of institutional credit to agriculture sector in India observed that there seems to be a direct relationship between institutional credit flow and the level of agricultural development. For instance, per unit disbursement of institutional credit has been significantly higher in states like Haryana (₹ 34, 012/ha), Kerala (₹ 56, 890/ha), Punjab (₹ 46, 593/ha), Tamil Nadu (₹ 52, 427/ha), and low in states like Assam (₹ 1, 979/ha), Bihar (₹ 8, 880/ha), Madhya Pradesh (₹ 9, 627/ha), Orissa (₹ 6, 370/ha), Rajasthan (₹ 6, 673/ha), etc. however, regional disparities in the distribution of institutional credit seem to have declined over time. The coefficient of variation in the distribution of institutional credit across states was 122 per cent in 1990-91 which declined to 94 in 2000-01 and further to 81 per cent in 2007-08. But, 81 per cent is quite a significant level which reveals that the regional disparities in institutional

credit flow do exist and are still a part of rural credit system. Therefore, efforts should be made to enhance the resource base by making investment in capital formation which, in turn, will be helpful to bridge the flow of institutional credit between advanced and backward states.

2.3.4 Credit Gap among Size of Land Holdings

The size distribution of operational holdings has been broadly classified into marginal (less than 1 hectare), small (1 to 2 hectares), semi-medium (2 to 4 hectares), medium (4 to 10 hectares) and large farmers (above 10 hectares). According to 2001, the small and marginal farmers constituted more than 80 per cent of the operational holdings and about 36 per cent of the area in India. They get only 50 per cent of the institutional credit while the remaining 50 per cent of the institutional credit goes towards 20 per cent of the operational holding. This shows that there is a large credit gap among the size of land holdings. Some of the earlier studies (other countries) has been undertaken which attempted to analyse the credit gap among the size of land holdings.

Grant and Anne (1996) made an analysis of the relationship between bankers and farmers in Britain and Ireland. The findings of the study revealed that, it is the larger farmers who are best able to take advantage of the lending opportunities on offer, and the relationship between agriculture and finance reinforces the long term trend towards the development of larger, more commercial farming enterprises and the elimination of smaller, more marginal units. They asserted that in both countries, farming is treated by lenders as a highly specialized segment of the market. Even if it no longer requires state sponsored lending institutions, the banks maintain specialist agricultural departments staffed by individuals with a farming background or training and with close links with the agricultural community.

Senanayaka and Ho (2002) conducted a study on who have more access to cheap credit in Vietnam? came up with the view that the poor have really lacked the opportunity to gain access to credit from the formal sector due to the non-availability of assets for using as collateral but it does not mean that they need loans at subsidized interest rates. So, it is more important to improve the accessibility to credit rather than providing it at subsidized rates of interest. They observed that the poor are very much willing to borrow at normal market rate of interests and they have the capacity to

repay too. Considering this fact, they suggested that providing the accessibility to credit would help to increase productivity, incomes and employment in the rural areas and subsequently ensure the long-term viability of rural financial institutions.

Corpus and Kraft (2005) found during their study that while credit subsidies are intended for the small farmers, loans at subsidized interest attract the big, wealthy borrowers as well. A bank faced with both types of borrowers is more likely to lend, or lend more to bigger borrowers whom it considers less risky.

Narasaiah and Ramudu (2008) in their study on financing of agriculture by regional rural banks revealed that the percentage of farmers receiving institutional credit varied widely in different parts of the developing world. About 5 per cent of farmers in Africa obtained institutional credit, while the proportion in Latin America and Asia (excluding Taiwan) is about 15 per cent. In the case of small farmers, coverage by institutions is even more limited. Large farmers had been the main beneficiaries of institutional credit. It was common to find 70 to 80 per cent of small farmers in a given country with virtually no access to such credit: in Pakistan almost 60 per cent of the farmers received 3 per cent of the institutional credit. In Bangladesh the larger farmers received more than 80 per cent of the loans from the agricultural bank and the co-operative banking system. In Philippines, 27 per cent of the larger farmers working on 61 per cent of the land received 98 per cent of the institutional credit.

Gaisina (2010) noted that commercial banks prefer to give loans to large-scale agricultural enterprises. In 2007, these enterprises received 95.5 per cent of the total credit lent to the agricultural sector whereas the share of loans to private family farms was minimal and continues to decrease. Banks are wary of lending to small rural households and private family farms because of the unacceptably low rate of return, the high risk, the small size of loans, and high transaction costs.

On the other side, there are various studies has also been undertaken in Indian context which attempted to analyse the credit gap among the size of land holdings. In this way, Bhattacharya and Sivasubramanian (2001) studied the various aspects of banking sector reforms in India. They concluded that there has been an increasing concentration of bank credit in the upper credit ranges during the post-reform period. During the 1970s, about 99.9 per cent of the accounts for credit limit up to C 2.5

million accounted for 49.5 per cent of credit. During the 1980s, the same proportion of accounts accounted for 54 per cent of the credit, but this has sharply declined to 40 per cent of the credit in the post-reform period.

The Rural Finance Access Survey (2003) reveals that 87.0 per cent of marginal farmers and 69.2 per cent of the small farmers are not getting the facilities of loans from the formal institutional agencies. Access to formal credit is particularly a problem for the poor when trying to meet unforeseen expenditure, and difficulty in accessing formal finance has resulted in a heavy reliance among poorer rural households on informal finance mostly moneylenders and shopkeepers. The survey also points out that the borrower who gets the loans have to bribe the officials, clients often have to pay hefty bribes (ranging from 10 to 20 per cent of the loan amount) to access loans.

Mohan (2004) examining the status, issues and future agenda of agriculture credit in India and found that there has actually been continuous growth in the number of accounts in all size-wise categories in the case of commercial banks in the 1990s. It was probably the case that the introduction KCCS had aided this process in the recent years. But it is equally true that the share of small farms in total credit appears to be falling to a certain extent.

Sahu (2004) while analyzing the institutional finance for agriculture found that the distribution of loan accounts by size-class of landholdings at all India and state levels shows that better-off farmers had improved access to formal credit as compared to small and marginal farmers. The small percentage of farmers who accessed formal credit with more loan amount per account in most of the states was in favour of a particular group of borrowers. This indicates that bankers adopted both price and non-price credit rationing technique in the borrower selection and fixation of credit amount. Further he pointed out that at the state level, irrigation and banking facility were two very important factors that determined the supply of credit per hectare of gross cropped area.

Sahu and Rajashekhar (2005) analyzed banking sector reform and credit flow to Indian agriculture. They found that in case of agricultural loans with credit limit of less than ₹ 25, 000, the proportion of accounts to total loan accounts and amounts to the total net bank credit declined during the reform period. Although the proportion of

accounts for the credit limit of more than ₹ 25,000 increased in the case of agricultural sector, the net credit declined during the reform period. This suggests that there was a neglect of small borrowers by SCBs and that the access of formal credit to small borrowers was adversely affected.

Sidhu and Gill (2006) studied the agricultural credit and indebtedness in India. The finding of the study revealed that the small and marginal farmers constituted 80 per cent of the operational holdings and cultivated about 36 per cent of the area in India were disadvantageously placed with respect to access to technology, capital, credit and other institutional support. Their access to credit to meet their short-term and long-term capital requirements had not improved over time. Yet, the high share of small holders in institutional loans can be attributed to target lending to them and higher share of Southern states in total advances where the proportion of small holdings is very high. Some medium and large farmers also obtained sizeable loans in the name of small holders.

Ramkumar and Chavan (2007) analyzed the revival of agricultural credit in the 2000s. They stated that the much of the increase in the total advance to agriculture in the 2000s were due to the sharp increase in the number of loans with the credit limit of ₹ 10 crore and above and particularly ₹ 25 crore and above. According to them, the growing shift towards loans with large credit limits in recent times is closely related to the changes in official policy on agriculture in India which increasingly favours the growth of a capital-intensive and export-oriented production pattern in agriculture. Further, the most significant beneficiaries of the increase in direct advances since the late 1990s were the big cultivators (who possessed land above 5 acres).

Sahu (2007) attempted to analyze the supply of institutional credit to agriculture for major states in India. The study revealed that the access to formal credit by the small and marginal farmers had gone down in the year 1996-97 as compared to 1990-91 in all the states except Gujarat. Among the states, the proportion of marginal and small farmers having access to institutional credit was the highest in Punjab (26.7 per cent) in 1996-97 followed by Tamil Nadu and Andhra Pradesh. However, in states like Bihar, Madhya Pradesh, Uttar Pradesh, Haryana and Maharashtra only 5 to 6.7 per cent of the marginal and small farmers had access to formal credit in the same year. For farmers with more than 2 hectares of operational

holding (medium and large), 63.2 per cent of them were accessing formal credit in Tamil Nadu followed by Kerala (45 per cent), and Punjab (31.6 per cent) in 1996-97. The percentage of medium and large farmers having access to institutional credit was substantially lower in the states like Madhya Pradesh, Rajasthan and Maharashtra. He, therefore, concluded that even the same size of landholdings was having, there was uneven access to formal credit across the states.

Balakrishnan *et al.*, (2008) in their study on agricultural growth in India since 1991 found that the large proportion of population in the lower strata, having major share in the land holdings receives much less credit than its requirements. This is because the banking system is still hesitant on various grounds to purvey credit to small and marginal farmers. They observed that this growing disparity between marginal, small and large farmers continues to be a cause for concern. This observed phenomenon may be attributed, inter alia, to the "risk aversion" tendency of the bankers towards small and marginal farmers as against the large farmers, who are better placed in offering collaterals. Further they calls for concerted efforts to augment the flow of credit to small and marginal farmers, alongside exploring new innovations in product design and methods of delivery, through better use of technology and related processes.

Kumar *et al.*, (2010) while analyzing the status, performance and determinants of institutional credit to agriculture sector in India observed that, the distribution of institutional credit across farm-size categories is also skewed. Though, the majority of farmers (82%) in India possess less than two hectares of land, they together account for only 50 per cent of the institutional credit; while18 per cent of the farmers having more than two hectares of land, account for 49 per cent of the institutional credit. It may be mentioned that 18 per cent of these farmers operate about 53 per cent of the total cultivable land in the country. The share of farmers having up to 2.5 acres of land, in total institutional credit has declined from 27 per cent in 1982-83 to 25 per cent in 2005-06. However, the share of farmers operating 2.5-5 acres of land has increased from 19 per cent in 1982-83 to 25 per cent in 2005-06. The share of large farmers, operating greater than 5 acres of land, in institutional credit has witnessed a modest decline from 53 per cent in 1982-83 to 49 per cent in 2005-06.

2.4 Research Gaps Identified from the Review of Literature

From the review of literature given above it is clear that many of the studies are inadequate either in terms of methodologies or in terms of coverage specified by them. The following may be offered as important research gaps identified on the basis of our review.

I. Majority of the studies show that up to 1990 the share of agricultural credit in total bank credit was rising with fluctuations but thereafter it started to decline.

II. While analyzing the performance of multi-agency network for agricultural credit, many studies has found that co-operative banks has lost their dominant position particularly after 1990 as compared to other institutional agencies.

III. Many studies has found that the banks are hesitant to advance credit to small farmers who make dominant farming population of the country whereas large farmers has easy accessibility to formal credit institutions.

IV. There is a wide range of inter-region or state variation in the accessibility of institutional credit by most of the studies attempted. The growth was uneven amongst the states or regions.

These are the issues which needs to be explored further in detail, to bring about the necessary changes in attitudes and practices of rural credit institutions. Therefore, there is a need for a study which examines the share of agricultural credit to total bank credit as well as to examine the performance of formal credit institutions during the post-reform period. The present study is an attempt to see the credit gap amongst the farmers as well as amongst the different regions of the country.

Chapter-3

Methodology and Data Source

CHAPTER-3
METHODOLOGY AND DATA SOURCE

This chapter deals with the locale of the study area, sources and nature of data used and various statistical tools and techniques employed for analysing the data. The methodology is described under the following heads:

3.1. Locale of the study area

3.2. Nature and sources of data

3.3. Analytical tools and techniques employed

3.4. Definition of terms and concepts used in the study

3.1. Locale of the Study Area

The present study is undertaken in region level as well as all India level during the period from 1975-76 to 2009-10.A multi-agency approach comprising co-operative banks, scheduled commercial banks and regional rural banks has been followed for purveying credit to agriculture at all India level.

As regional level, the study took only the disbursement of institutional outstanding credit by scheduled commercial banks to agriculture sector during the post-reform period in different regions of India. In our analysis the country is divided into six regions, namely, Northern Region, North-Eastern Region, Eastern Region, Central Region, Western Region and Southern Region. The Northern Region includes the States and Union Territories viz., Jammu & Kashmir, Himachal Pradesh, Rajasthan, Haryana, Punjab, Delhi and Chandigarh. Assam, Manipur, Meghalaya, Mizoram, Arunachal Pradesh, Nagaland and Tripura States constitute the North-Eastern Regions[1]. The state and Union Territories viz., Bihar, Jharkhand, West Bengal, Orissa, Sikkim and Andaman & Nicobar are included in Eastern Region. The Central Region comprises the States of Uttar Pradesh, Uttarakhand, Madhya Pradesh and Chattisgarh. Western Region is the combination of the States and Union Territories of Gujarat, Maharashtra, Goa, Daman & Diu and Dadra & Nagar Haveli.

[1] Sikkim state was included in North-Eastern Region until 2002.

Lastly, Southern Region consists of the States and Union Territories of Andhra Pradesh, Karnataka, Tamil Nadu, Kerala, Lakshadweep and Pondicherry.

The study uses the published data of the Reserve Bank of India on loans provided to cultivators which is classified by the size of operational holdings for the distribution of direct institutional outstanding credit (short and long-term) to farmers based on the size of land holdings during the last two decades (1991 to 2000 and 2001 to 2010). According to RBI, cultivators operating less than 2.5 acres are referred to as "marginal" cultivators, between 2.5 and 5 acres as "small" cultivators and above 5 acres as "big"[2] cultivators respectively.

3.2. Nature and Sources of Data

For evaluating the objectives of the study, secondary data were collected from different sources. The study is largely based on analysis of the published time series data covering the period from 1975-76 to 2009-10. The following are the data sources: Handbook of Statistics on Indian Economy, Statistical Tables Relating to Banks in India, Basic Statistical Returns published by Reserve Bank of India, Food and Agriculture Organisation (FAO) of the United Nations, All India Rural Credit Survey, 1954, National Climate Change (NCC) Research Report, Money and Banking of Centre for Monitoring Indian Economy (CMIE) Report and Agricultural Statistics at a Glance, Directorate of Economics and Statistics of Ministry of Agriculture, Government of India.

3.3. Analytical Tools and Techniques Employed

For analysis of trends and composition of institutional credit to agriculture, statistical tools like compound annual growth rates (CAGR) has been used for trends analysis, coefficient of variation has been used to check the variability in the composition of institutional credit to agriculture, diagrammatic representation and above all, regression analysis have been used.

The compound annual growth rate has been computed in two different ways which are shown in the form of two types of equations:

1) For computing the compound annual growth rate, the study fits exponential trend equations for the period 1975-76 to 2009-10. In a regular time series (say

[2] "Big" cultivators consist of both medium and large farmers.

x_t) with an interval of generally one year, average annual growth rate in the series is usually obtained by estimating an exponential equation of the type:

$$x_t = b_0 b_1^t e^{u_t}$$

where,

'e' stands for the base of natural logarithm.

'u_t' represents disturbance term associated with 'x' variable at time 't'.

The unknowns 'b_0' and 'b_1' are estimated through the ordinary least squares (OLS) method as applied to the linearized version (achieved through logarithmic transformation) of the given function. The growth rate 'r' in (x_t) is then computed as:

$$r = [\text{Antilog } (\hat{b}_1)-1] * 100$$

where,

'r' represents compound annual growth rate

The study examines the hypothesis of constancy, increasing and decreasing in the rates of growth in an institutional outstanding credit to agriculture during the post-reform period in India. The conventional approach for such analysis is to carry out for the usual growth rate analysis over the sub-periods (In this case for pre-reform period from 1975-76 to 1990-91 and, for the post-reform period from 1991-92 to 2009-10). The conventional approach has two major drawbacks:

- The number of observations available for estimation of rates of growth should be fairly large (say $\geq$ 14). However, sub-periodization may result in a severe loss of degrees of freedom available for estimating of the rates of growth.
- The approach pre-assumes constancy in the rates of growth within each of the sub-periods which, however, may be far from reality in a multiplicity of situations (Sethi, 2008).

Keeping in mind these limitations associated with the conventional approach, the following alternative approach has been undertaken.

For this purpose, we may estimate an exponential equation of the type:

$$x_t = b_0 b_1^{(1-D)t} b_2^{D_t} e^{u_t} \quad \text{.....(i)}$$

where,

'D' stands for a dummy variable, assuming values of 0 and 1 during pre and post-reform periods respectively.

During the pre and post-reform period, equation (i) would be equivalent respectively to:

$$x_t = b_0 b_1^{t} e^{u_t} \text{ and } x_t = b_0 b_2^{t} e^{u_t} \quad \text{.....(ii)}$$

Providing rate of growth in the corresponding periods as:

$$r_1 = [\text{Antilog } (\hat{b}_1)-1] * 100 \text{ and } r_2 = [\text{Antilog } (\hat{b}_2)-1] * 100 \quad \text{....(iii)}$$

where,

'r_1' represents the compound annual growth rate during the pre-reform period

'r_2' denotes the compound annual growth of the post-reform period.

In fact, these two rates of growth would be computed respectively from the two sub-parts of the series. Nevertheless, as could be easily seen, the two rates could be obtained in a single stroke from the estimation involving the entire series. The equation (i) could be rewritten as:

$$x_t = b_0 b_1^{t} b_1^{-D_t} b_2^{D_t} e^{u_t}$$

$$x_t = b_0 b_1^{t} (b_2/b_1)^{D_t} e^{u_t}$$

$$x_t = b_0 b_1^{t} c_2^{D_t} e^{u_t} \quad \text{.....(iv)}$$

where, $c_2 = b_2/b_1$.

From the entire series, the unknowns b_0, b_1 and c_2 [Hence, $b_2 = b_1/c_2$] could be obtained through the OLS technique, as applied to the log-linear version of (iv). Therefore, the rates r_1 and r_2 are obtained through (iii).

2) To compute the CAGR for the period 1992 to 2010, the study has uses the semi-log model, such as:

$$\ln Y_t = \beta_1 + \beta_2 t + u_t$$

where,

'Y_t'is the value of the variable in t^{th}year whose CAGR is to be find out;

'**t**' is the time period. Number 1, 2, 3, etc. were used for the consecutive year;

'β_1' and 'β_2' are parameters to be estimated;

'u_t' is the disturbance term.

After estimating the above regression model, the following formula has been used for computing CAGR:

$$r = (\text{Antilog of the estimated } \beta_2 - 1)*100.$$

where,

'**r**' is the compound annual growth rate (in %).

Agricultural production function is assumed to be the function of availability of credit, labour force, cropped area, water, pesticides, fertilizer, etc. Thus the amount of agricultural output is dependent upon the above mentioned inputs. However, in this study Agricultural Gross Domestic Product (AGDP) is used as dependent variable and Institutional credit (IC), Gross Sown Area (GSA), Gross Irrigated Area (GIA), Agricultural Labour Force (ALF), consumptions of Fertilizers (FC) and Rainfall during the period of June to September (RN) are taken as independent variables. There are also other important variables (improved seeds, tractors, electricity, pesticides, etc.) which determined agricultural production but they can be purchased only with the availability of credit. The AGDP is hence indirectly affected by credit. Therefore, credit is included as an explanatory variable in the model on the basis of the argument of Carter (1989) and Iqbal *et al.* (2003).

For estimating whether the relationship between the two variables has undergone a significant change, due to various banking sector reform initiated in the early 90s, the entire period is divided into two: 1975-76 to 1990-91 and 1991-92 to 2009-10. The study has used Cobb-Douglas (CD) Production Function by utilizing Ordinary Least Squares (OLS)[3] procedure for the period 1975-76 to 2009-10, to estimate whether the institutional credit to agriculture has undergone a significant change due to various banking sector reform initiated in the early 1991. The Cobb-

[3] In statistics, ordinary least squares (OLS) is a method for estimating the unknown parameters in a linear regression model.

Douglas model is used primarily because the resulting coefficients (elasticities) indicate the relative importance of each input with respect to output (Zuberi, 1989). The variables used in the study have been collected from different secondary sources. The data regarding variables AGDP, IC, GSA, GIA and FC is from Handbook of Statistics on Indian Economy published by RBI, Mumbai. Data on ALF has been obtained from Food and Agriculture Organisation of the United Nations (FAO) and the data on RN is from two sources; (I) National Climate Change (NCC) Research Report for the period 1975-76 to 1991-92 and (II) Agricultural Statistics at a Glance from 1992-93 onwards.

The null hypothesis of the study is that the availability of institutional outstanding credit to agriculture has negative impact on agricultural gross domestic product during the post-reform period (1991-92 to 2009-10) in India. In this study the hypothesis is tested under 1%, 5 % and 10% level of significance. The level of significance is the measure of the degree of risk that we make while interpreting results. As it is the null hypothesis that is generally being tested we are always looking for low ***P*** values to reject this hypothesis. The ***P*** value is the probability of attaining a test statistics to establish that the hypothesis being tested is true.The smaller the ***P*** value the more assured be the conclusion drawn from it.

Based on the above discussion, the Cobb-Douglas production function enables us to estimate the contribution of each individual input in the production function. But since the function is in non-linear form, all the variables have to be transformed into logarithmic form to obtain a linear model. Thus, we have the following linear model:

$$lnAGDP_t = \beta_1 + \beta_2 lnIC_t + \beta_5 lnALF_t + \beta_3 lnGSA_t + \beta_7 lnRN_t + \beta_4 lnGIA_t + \beta_6 lnFC + D_t + D_t * lnIC_t + \mu_t$$

where,

$lnAGDP_t$ = Natural logarithm of agricultural gross domestic product at constant prices;

$lnIC_t$ = Natural logarithm of institutional outstanding credit at constant prices;

$lnALF_t$ = Natural logarithm of agricultural labour force;

$lnGSA_t$ = Natural logarithm of gross sown area;

$lnRN_t$ = Natural logarithm of rainfall;

$lnGIA_t$ = Natural logarithm of gross irrigated area;

$lnFC_t$ = Natural logarithm of consumption of fertilizers;

D_t = Dummy variable (d =1 for post-reform period for the year 1991-92 to 2009-10; Else = 0 for pre-reform period for the year 1975-76 to 1990-91);

D_t*lnIC_t = Cross product of dummy variable and natural logarithm of institutional outstanding credit at constant prices;

μ_t = Random error term independently and identically distributed with zero mean and constant variance;

t = denotes time trend.

We assume β_1(intercept) i.e., technology remains constant. The coefficient ofβ_2, β_3, β_4, β_5, $\beta_6$and β_7 are the output elasticities to be estimated.

In order to avoid the problem of multicollinearity, all the variables included in the study (the dependent and all the independent variables) are expressed in terms of per cultivated ten lakh hectares (Iqbal, *et al.*, 2003; Ahmad and Masood, 2010). Besides to estimate the Cobb-Douglas type production function all the variables are also converted into log form. Thus we can have the following model:

$$lnphAGDP_t = \beta_1 + \beta_2 lnphIC_t + \beta_5 lnphALF_t + \beta_3 lnphGSA_t + \beta_7 lnphRN_t + \beta_4 lnphGIA_t + \beta_6 lnphFC + D_t + D_t*lnphIC_t + \mu_t$$

where,

$lnphAGDP_t$ = Natural logarithm of agricultural gross domestic product per cultivated ten lakh hectare at constant prices;

$lnphIC_t$ = Natural logarithm of institutional outstanding credit per cultivated ten lakh hectares at constant prices;

$lnphALF_t$ = Natural logarithm of agricultural labour force per cultivated ten lakh hectares;

$lnphGSA_t$ = Natural logarithm of gross sown areaper cultivated ten lakh hectares;

$lnphRN_t$ = Natural logarithm of rainfall per cultivated ten lakh hectares;

$lnphGIA_t$ = Natural logarithm of gross irrigated area per cultivated ten lakh hectares;

$lnphFC_t$ = Natural logarithm of consumption of fertilizers per cultivated ten lakh hectares;

D_t = Dummy variable (d =1 for post-reform period for the year 1991-92 to 2009-10; Else = 0 for pre-reform period for the year 1975-76 to 1990-91);

$D_t*lnphIC_t$ = Cross product of dummy variable and natural log of institutional outstanding credit per cultivated ten lakh hectares;

μ_t = Random error term independently and identically distributed with zero mean and constant variance;

t = denotes time trend.

Estimation of the Cobb-Douglas type production function in the transformed model of expressing the variables in per cultivated ten lakh hectares showed that they are not highly correlated, although some degree of multicollinearity is still present in the model.

To reduce the presence of multicollinearity and autocorrelation in our Cobb-Douglas production type function, all the variables are transformed into log difference form. Then, we have the following linear model:

$$lndfAGDP_t = \beta_1 + \beta_2 lndfIC_t + \beta_5 lndfALF_t + \beta_3 lndfGSA_t + \beta_7 lndfRN_t + \beta_4 lndfGIA_t + \beta_6 lndfFC + D_t + D_t*lndfIC_t + \mu_t$$

where,

$lndfAGDP_t$ = Log difference of agricultural gross domestic product at constant prices;

$lndfIC_t$ = Log difference of institutional outstanding credit at constant prices;

$lndfALF_t$ = Log difference of agricultural labour force;

$lndfGSA_t$ = Log difference of gross sown area;

$lndfRN_t$ = Log difference of rainfall;

$lndfGIA_t$ = Log difference of gross irrigated area;

$lndfFC_t$ = Log difference of consumption of fertilizers;

D_t = Dummy variable (d =1 for post-reform period for the year 1991-92 to 2009-10; Else = 0 for pre-reform period for the year 1975-76 to 1990-91);

$D_t*lndfIC_t$ = Cross product of dummy variable and log difference of institutional outstanding credit;

μ_t = Random error term independently and identically distributed with zero mean and constant variance;

t = denotes time trend.

The variables which are included in the Cobb-Douglas model as dependent and independent are defined as follows. AGDP and IC are measured in Rupee (C) crore at constant prices, GSA and GIA are measured in ten lakh hectares and, the data for the year 2009-10 for GSA and GIA are extrapolated, FC measured in lakh tonnes, ALF is measured in thousand persons and RN is measured in millimetre. IC for agriculture sector comprises of direct and indirect outstanding credit to agriculture and allied activities. Direct (short and long-term) outstanding credits are disbursed by Cooperatives, Scheduled Commercial Banks (SCBs) and Regional Rural Banks (RRBs) whereas indirect outstanding credits are disbursed by cooperatives, SCBs, RRBs along with Rural Electrification Corporation Ltd. (REC). FC includes Nitrogen, Phosphorous and Potassium ($N+P+K$). Agricultural labour force is the number of economically active persons engaged in agriculture. The data on rainfall is taken from

June to September. Dummy (D) has been taken for pre-reform (1975-76 to 1990-91) and post-reform (1991-92 to 2009-10) period. All the real values were computed using 2004-05 as the base year.

3.4. Definition of Terms and Concepts Used in the Study

Advance: The amount of loan advanced by an institution, during a particular period, year or season.

Agricultural Credit: Agricultural credit is the amount, either in cash or in kind or in both form, made available for agricultural production received from the external sources (institutional and non-institutional), to be repaid in the specific period of time to the lender, with some interest for the use of funds by the borrower. The present study considered only the institutional sources of agricultural credit which provided for the purpose of agricultural use.

Agricultural Finance: Agricultural finance generally means studying, examining and analysing the financial aspects (include money matters relating to production of agricultural products and their disposal) pertaining to farm business.

Agricultural Labour Force: Agricultural labour force is the actual number of people available for work in agricultural field.

Cash Reserve Ratio: The commercial banks are required to keep a certain amount of cash reserves at the Reserve Bank of India. This percentage amount is called cash reserve ratio.

Credit: A contractual agreement in which a borrower receives something of value now and agrees to repay the lender at some date in the future, generally with interest.

Gross Cropped Area: Gross cropped area represents the total area sown once and / or more than once in a particular year, i.e, the area is counted as many times as there are sowings in a year. This total area is also known as total cropped area or total area sown.

Gross Domestic Product: Gross Domestic Product is the market value of all the final goods and services produced within a country over a given period of time.

Gross Irrigated Area: Gross Irrigated Area is the total area under crops, irrigated once and / or more than once in a year. It is counted as many times as the number of times the areas are cropped and irrigated in a year.

Gross Sown Area: Gross sown area is the area sown more than once in an agricultural year plus net sown area.

Integrated Rural Development Programme(IRDP): The Integrated Rural Development Programme was a rural development programme of the Government of India launched in financial year 1978 and extended throughout India by 1980.

Kisan Credit Card Scheme:Kisan Credit Card (KCC) is a credit card to provide affordable credit for farmers in India. It was introduced with effect from 1998-99 for timely and easy availability of the production credit to the farmers. The scheme is being implemented by the commercial banks, cooperative banks and regional rural banks.

Large Farmers: According to the RBI published data, cultivators operating more than 5 acres are referred to as large farmers. Large farmers consists of both medium and large farmers.

Marginal Farmer: According to the RBI published data, cultivators operating less than 2.5 acres are referred to as marginal farmers.

Micro Finance Institutions (MFIs): Micro Finance Institutions are those institutions which provides financial services such as saving account, insurance fund and credit to poor and low income clients so as to help them to rise their income and there by improve their standard of living.

National bank for agriculture and rural development (NABARD): National bank for agriculture and rural development is the apex banking institution providing finance for agriculture and rural development. It was established on July 12, 1982 with the aim for providing credit for promotion of agriculture, small scale industries, cottage and village industries, handicrafts and other allied economic activities in rural areas with a view to promote integrated rural development and securing prosperity in rural areas.

Net Bank Credit: Net Bank Credit is the Gross Bank Credit minus exempted deposits like Foreign Currency Non-Resident (FCNR[4]) accounts, Non-Resident Non-

[4]Foreign Currency Non Resident (FCNR) accounts can be opened and maintained by a non-resident Indian who may be an Indian citizen or a foreign citizen of Indian Origin residing outside India. The accounts are convertible / repatriable and are maintained in foreign currency in the form of fixed deposits.

Repatriable(NRNR[5]) deposits. This is the basis on which achievement of priority sector lending targets is calculated.

Net Sown Area: Net sown area is the total area sown with crops in a country. Area sown more than once is counted is counted once only.

Non-Performing Assets (NPA): Non-Performing Assets signify those distributed loans by banks and financial institutions against which repayment of principal and the due interest payment is not timely made. Once the borrower has failed to make interest or principal payments for 90 days the loan is considered to be a non-performing asset.

Regional Rural Banks (RRBs): Regional Rural Banks were established in 1975, with a view to developing the rural economy as well as to create an alternative channel to the cooperative credit structure so as to ensure sufficient institutional credit for the rural and agriculture sector.

Rural Infrastructure Development Fund(RIDF): Rural Infrastructure Development Fund was instituted in NABARD with an announcement in the Union Budget 1995-96 with the sole objective of giving low cost fund support to State Governments and State Owned Corporations for quick completion of ongoing projects relating to medium and minor irrigation, soil conservation, watershed management and other forms of rural infrastructure.

Self Help Groups (SHGs): Self-Help Groups is a village-based financial intermediary usually composed of 10-20 local women having homogeneous social and economic backgrounds, all voluntarily coming together to save regular small sums of money, mutually agreeing to contribute to a common fund and to meet their emergency needs on the basis of mutual help.

Small Farmers: According to the RBI published data, cultivators operating in between 2.5 acres and 5 acres are referred to as small farmers.

Statutory liquidity ratio: Statutory liquidity ratio refers to the amount that the commercial banks require to maintain in the form of gold or government approved

[5]A Non-Resident Non-Repatriable (NRNR) deposits were governed by Foreign Exchange Management (Deposit) Regulations, 2000. An individual NRI and Overseas Corporate Body (OCB) were eligible to open and maintain NRNR account till 31-03-2002. NRNR deposits were designated in Indian Rupees in the form of savings, current and recurring or fixed deposit accounts.

securities (bond and shares of different companies) before providing credit to the customers. It is determined and maintained by the Reserve Bank of India.

Taccavi loans: '*Taccavi*' loans are those loans which were granted by the Government of India for agricultural purposes during the period of natural calamities and other difficulties. They were long-term in character. These loans were routed through the Revenue department of the State Government.

Twenty Point Economic Programme: Twenty Point Economic Programme was launched by Government of India in 1975 with important objectives of eradication of poverty and improvement in the quality of life of the common man, which included a point related to the issue of rural indebtedness.

Chapter-4

Credit Flow to Agriculture: Trends and Composition of Different Institutions

CHAPTER-4

CREDIT FLOW TO AGRICULTURE: TRENDS AND COMPOSITION OF DIFFERENT INSTITUTIONS

The introduction of institutional credit in the early 20th century[1] in India is observed as a protective measure to save the farmers from the control of landlords and moneylenders. From 1904 to 1969, cooperative agencies were the primary sources of institutional agencies that provided credit to agriculture. The All India Rural Credit Survey report (1954) revealed that, despite the existence of co-operative credit societies for over 50 years, it accounted for only 3.1 per cent of the total borrowings of the cultivators while commercial banks accounted for a meagre i.e., 0.9 per cent. One of the important recommendations of the committee was that the Imperial bank of India should be nationalized and designated as State Bank of India and charged with the special responsibility for expanding the coverage of rural credit. In 1961-62,the All-India Rural Debt and Investment Survey[2], pointed out that, over 10 years, borrowings from the co-operatives had increased from 3.1 to 15.5 per cent. Even though the share of co-operative credit to total borrowings had increased, it faced some perennial weaknesses, such as small membership, weak capital structure, inadequate loan operations, heavy over dues, failure to harness local savings and to promote thrift continued much as before .

Since the introduction of Green Revolution, credit has occupied an important place in the strategy of agricultural development. This is because of the increase in capital investment and the use of technological innovations in crop production. It brought more and more credit needs for inputs like improved seeds, pesticides, fertilizers, new machines, and technology for increasing in the agricultural production process. In early 1968, the Government of India introduced the scheme of Social Control over commercial banks. Under this scheme the banks were expected to diversify bank credit more widely and extend credit to priority sectors like agriculture and small scale industry. This brought the commercial banks in the realm of

1 Rural co-operative credit societies as an institutional source of credit to agriculture were introduced in 1904.

2 To assess the changes made since the AIRCS of 1951-52.

agricultural credit. Due to these reasons, 14 commercial banks were nationalised[3] in 1969 so as to make a breakthrough to the market of agricultural credit. But in 1972, the Khusro Committee[4]found that both cooperatives and commercial banks were not adequate to finance the agricultural credit due to certain problems. The committee reported that the main problems with the co-operative credit institutions was their organizational and financial weakness, although it was better spread from the geographical point of view and had better knowledge of local conditions. But the commercial banking system which has entered only recently into this field has no widespread organization and it does not hold intimate knowledge of the local conditions. Thus in 1975, Regional Rural Banks was established to provide credit to small and marginal farmers and weaker sections of society which would combine the advantages of both the co-operatives and the commercial banks leaving out the disadvantages of both.

Since 1975, institutional agencies that provided credit to agriculture sector are Scheduled Commercial Banks, Co-operative Banks and Regional Rural Banks which are commonly known as "multi-agency network". This led to impressive expansion of bank branches and together with subsidized agricultural credit brought a drastic change in the condition of the agricultural farmers. It provides facility to farmers to diversify agriculture sector by undertaking new investment or adopt new technology. NABARD was established with the recommendation of the CRAFICARD[5]to provide all types of production and investment credit needs for agriculture and rural development.

During the early period of the decade of 1990s, the country entered the new era through a transition from an inward-looking strategy to an outward-looking one. This outward-looking policy "deregulate financial institutions" which brought new challenges and opportunities to the majority of Indian farmers. Emphasis was shifted in favour of prudential regulations, and the focus on social banking got diluted. As a result, the share of agriculture in total bank credit of the scheduled commercial banks

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3 Another six commercial banks were nationalised in 1980.

4 In February 1969, a Banking Commission was appointed by Govt. of India headed by Prof. A.M. Khusro, to study all the important aspects of the working and credit institutions in India. The Committee submitted its report in 1972 which covers the entire field of institutional and functional coverage of the institutional credit to agriculture sector.

5 In March 1979, the RBI appointed Sivaraman Committee for reviewing the institutional credit for agriculture and rural development, known as Committee to Review Arrangements for Institutional Credit for Agriculture and Rural Development (CRAFICARD).

fell below the 18 per cent target. On the other side, in order to become more competitive and financially viable, banks started reducing their Non-performing assets (NPAs) by adopting the policy of mergers and acquisitions, which in turn, reduces the number of branches and other banking operations like advancement of loan etc., in rural areas.

The prime objective of the agricultural credit policy in India is to guarantee sufficient and timely credit to agriculture sector at reasonable rate of interest at a time when it is required. During the last two decades, Government of India took many initiatives to protect the farmers from individual sources of finance who exploit them with high rate of interest. A number of initiatives were taken to expand credit to agriculture such as the extension of the model of SHGs to farmers in early 1990s, introduction of RIDF from 1996-97, the issue of Kisan Credit Cards (KCCs) since 1999,doubling the flow of agricultural credit during the period 2004-05 to 2006-07 by all the financial institutions (proposed to increase the agricultural credit by 30 per cent per year), the revitalization of the cooperative credit structure and the Government's acceptance of the principle of inclusive banking, etc. Besides this, many committees were formed to look up to the condition of the farmers and made suggestions from time to time.

4.1. Trends in the Growth of Agricultural Credit

Historically, agricultural credit was advanced directly to farmers, which was called "direct finance to agriculture." These were divided into short, medium and long-term credit. Short-term credit provides the expenses for the ongoing agricultural operations on the farm like sowing, fertilizer application, plant protection measures, wages to casual labourers, etc. while the medium or long-term credit are needed for permanent improvements on the land, like leveling, construction of wells and farm buildings, purchase of land, tractors, bullocks, dairy animals, threshers, crushers, etc.

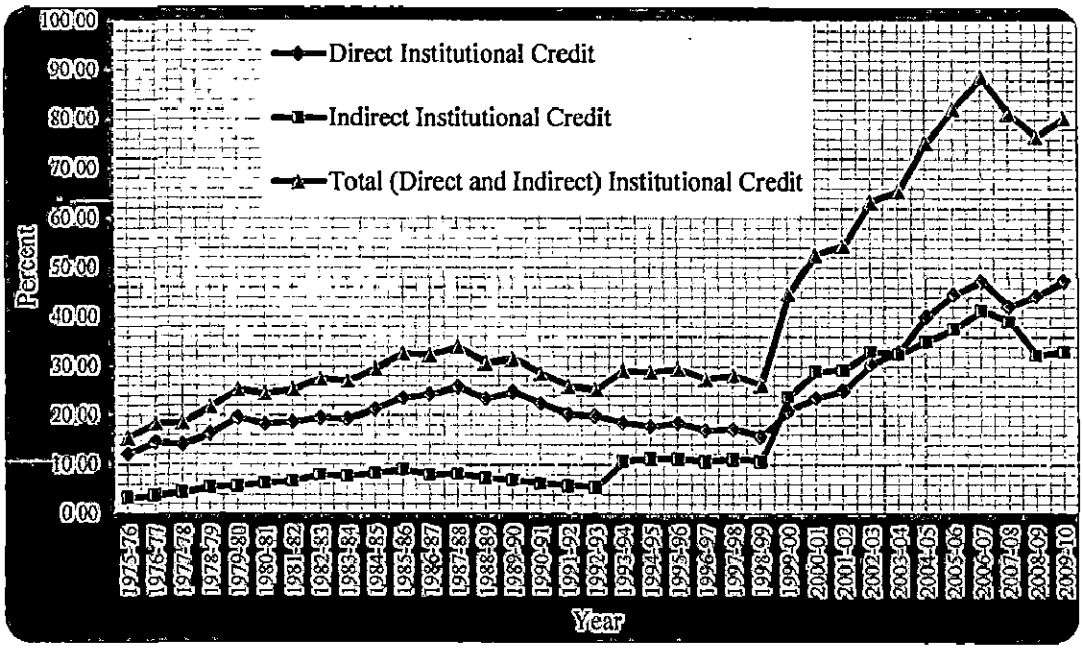
The other component of agricultural finance is called "indirect finance", which does not go directly to famers, but to the institutions like Primary Agricultural Credit Societies(PACS), Fertilizer Manufacturing Companies, and Construction of Warehouses which contribute to enhancing productivity of agricultural operations.

To see the behavior (trends) of direct, indirect and total institutional outstanding credit as percentage of agricultural gross domestic product (AGDP),the

study has divided time-series data into two period: 1975-76 to 1990-91 (pre-reform period) and 1991-92 to 2009-10 (post-reform period) which are depicted in Fig. 4.1 (the corresponding data is given in Appendix Table 1).

Fig. 4.1 shows continuous increase in the trends of direct institutional outstanding credit as percentage of AGDP during the pre-reform period. It increased from 12.13 per cent in 1975-76 to 25.77 per cent in 1987-88. But during the early decade of post-reform period (in the decade of 1990s) the trends of institutional outstanding credit as a percentage of AGDP declined continuously up to 1998-99. This was because during the early period of 1990s it was recommended to close down the loss-making branches or to merge them with the other banks (in the case of RRBs, the bank branches were merged with the sponsoring bank). "The decline in the number of rural bank branches together with increasing population pressure might have resulted in reduction of the credit flow to agriculture, loan demand and deposit supply might have been adversely affected, growth of private investment for agricultural development and financial deepening of the rural sector might have been severely affected and the access to a banking facility by the rural population might have come down" (Sahu and Rajasekhar, 2005).

Fig. 4.1:Trends of Institutional Credit (Outstanding) as Percentage of Agricultural Gross Domestic Product



Source: Handbook of Statistics on the Indian Economy2011-12,Reserve Bank of India.

In 1999-2000, the direct institutional outstanding credit as percentage of AGDP has increased to 20.90 per cent[6] which further increased to 23.58 per cent in 2000-01 and to47.28per cent in 2006-07. In 2007-08, it falls to 42.12 per cent but after that it again increased to 47.39 per cent in 2009-10.In short, during the second decade of the post-reform period the trends of direct institutional outstanding credit as percentage of AGDP were increasing with some fluctuation in the latter half of the period.

On the other hand during the pre-reform period, the trends of indirect institutional outstanding credit as percentage of AGDP were increasing continuously but started to fall after the mid-1980s. It was only 3.29 per cent in 1975-76 which increased marginally to 9.01 per cent during the mid-1980s, but thereafter it started to decline until 1992-93. During the post-reform period the trends was increasing with constant growth in the decade of 1990s. It increased from 5.43 per cent in 1992-93 to 10.59 per cent in 1993-94. This increment was because, since October 1993, direct and indirect finances have been considered together for meeting the priority sector target before which only direct finance was considered as a part of the priority sector target of 18 per cent for agriculture and allied activities (Ramakumar and Chavan, 2007). However, in order to ensure that the focus of banks on direct agricultural lending was not diluted, the "indirect" advance to agriculture was stipulated to be one-fourth of total agricultural lending or 4.5 per cent of net bank credit while meeting the priority sector target of 18 per cent for agriculture (Sahu and Rajasekhar, 2005). After that it remains constant and in 1999-2000 it grew tremendously to 23.77 per cent[7]. During the period from 1999-2000 to 2002-03, the share of indirect credit as a percentage of AGDP was more than the share of direct credit. Afterwards its share was less than the share of direct credit to agriculture and remained highest during the period 2006-07 but after that it was fluctuating.

The above Figure shows that the trends of total (direct and indirect) institutional outstanding credit as percentage of AGDP during the pre-reform period were increasing. It was 15.43 per cent in 1975-76, which increased to 33.95 per cent

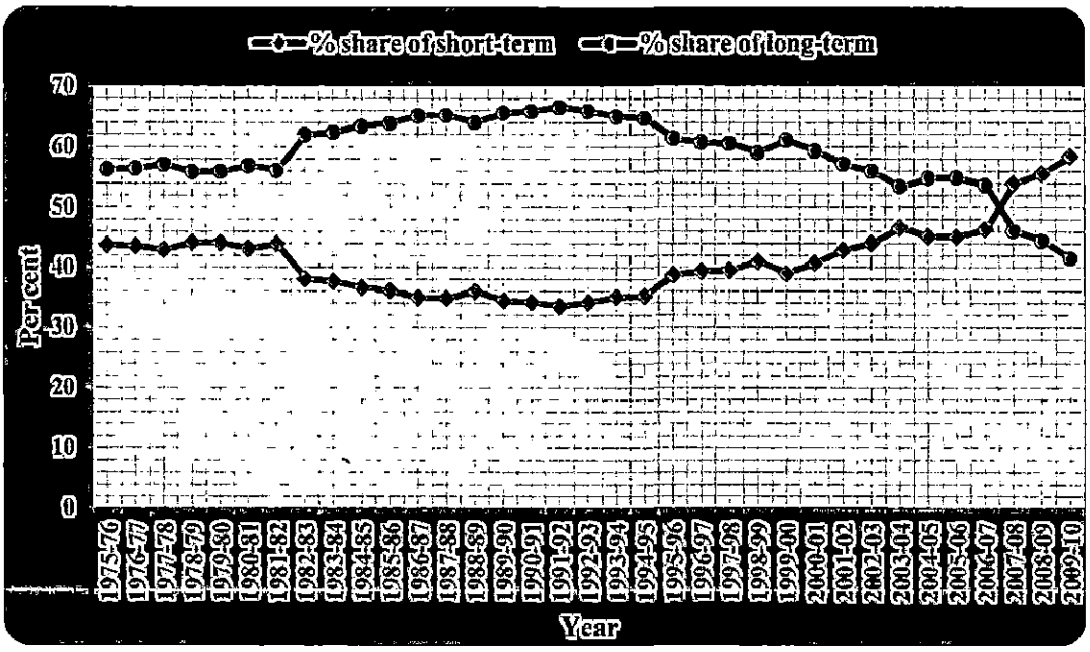
6 The data since 1999-2000 covers not only the credit from primary agricultural credit societies but also the state co-operative agricultural and rural development banks and primary co-operative agricultural and rural development banks of the long-term credit by cooperative societies, while the earlier period covered only primary agricultural credit societies.

7 Same as the reason of direct institutional outstanding credit to agriculture(as mentioned in footnote 6).

in 1987-88. During the post-reform period the trend was fluctuating but after 1999-2000, the trends of total institutional outstanding credit as percentage of AGDP was increasing tremendously and reached to maximum of 88.66 per cent in 2006-07. However, after that it also started declining because of the consistent falling in the indirect institutional outstanding credit as percentage of AGDP.

One of the important contributing factors to the rapid growth rate during the reform period was the policy decision to slash cash reserve ratio (CRR) and Statutory Liquidity Ratio (SLR)to accelerate the availability of funds to the banking sector and the borrowing from RBI was stepped up after 1991 to facilitate more funds to the scheduled commercial banks (Sahu and Rajasekhar, 2005). The major changes introduced in the definition of indirect finance in the decade of 1990s and after also led to the significant increase in the growth of indirect finance to agriculture (Ramakumar and Chavan, 2007).

Fig 4.2: Trends in the Share of Short and Long-term Credit as Percentage of Total Direct Institutional Agricultural (Outstanding) Credit in India (Per cent)



Source: Handbook of Statistics on the Indian Economy2011-12,Reserve Bank of India.

To obtain the share of direct short and long-term institutional outstanding credit to agriculture, the study depicts the ratio of short and long-term to total direct institutional outstanding credit, expressed in percentage terms for the period 1975-76 to 2009-10 in Figure 4.2. The figure shows continuous fall in the share of direct short-

term institutional outstanding credit to the total with some fluctuations in the later period of 1970s. But during the reform period its share increased continuously which was from 33.46 per cent in 1991-92 to 40.97 per cent in 1998-99, which further increased to 46.59 per cent in 2004-05. In 2009-10, it achieved more than half of the total credit i.e., 58.48 per cent. This increasing trend shows that farmers borrow more short-term credit to meet input needs for maintaining agricultural operations continuously. And it is also more convenient for the suppliers because short-term credit bears low credit risk, lower supervision and monitoring costs, and a better asset liability management (Golait, 2007).

As far as the share of direct long-term institutional outstanding credit as percentage to the total direct institutional outstanding credit is concerned, it had increased continuously during the pre-reform period with some fluctuation in the later half of 1970s but after that it increased tremendously up to 1990-91.During the reform period, the share of long-term fell continuously. It fell from 66.54 per cent in 1991-92 to 59.03 per cent in 1998-99, which further fell to 53.41 per cent in 2003-04 to41.52 per cent in 2009-10 (Appendix Table 2).

4.2. Growth Rate Analysis: Empirical Models during 1975-76 to 2009-10

Model A is the estimated growth rate equation which shows the growth in the total (direct and indirect) institutional outstanding credit to agriculture during the period 1975-76 to 2009-10. The result found is a positive growth and significant as shown by the *P* value of estimated coefficient of variable t. Here 'N' represents the total number of years taken in our study. x_t denotes institutional outstanding credit to agriculture for the given time period.

Model A:

$\ln x_t = 8.22 + 0.15\,t$

(0.00) (0.00)

$R^2 = 0.99, N = 35$

Note: Bracketed figures refer to '*P*' values

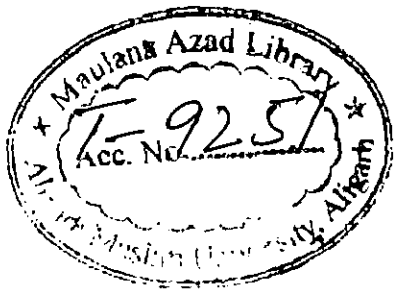
P value of estimated parameters and the coefficient of determination, R^2 of the model indicate better fit of the model and also appropriateness of semi-logarithmic

model for calculating annual growth. During the period from 1975-76 to 2009-10, the compound annual growth rate (r) for institutional outstanding credit to agriculture was 16.16 per cent.

For decomposition of the growth rate for pre-reform and post-reform period, the study depends on Model B which is a better model as described in the methodology. In Model B, estimated parameters of variable '(1-D)*t' shows the growth trend during pre-reform period while estimated parameter of 'D*t' represents the growth trend during post-reform period. Both the estimated parameters of '(1-D)*t' and 'D*t' are significant as shown by the corresponding *P* values. Significant *P* values together with high R^2 shows better fit of model.

Model B:

$$\ln x_t = \underset{(0.00)}{8.14} + \underset{(0.00)}{0.16\,(1\text{-}D)*t} + \underset{(0.00)}{0.15\,D*t}$$



$R^2 = 0.99, N = 35$

Note: Bracketed figures refer to '*P*' values

Model B also reports the compound annual growth rate (r) for the pre-reform and post-reform period. The growth was 17.54 per cent during the pre-reform period and 16.45 per cent during the post-reform period. Our analysis shows that there was a marginal decline in the growth of agricultural institutional outstanding credit during the post-reform period as compared to the pre-reform period.

A look at the Table 4.1 given below brings out the changes in the growth of direct institutional outstanding credit (short and long-term) to agriculture. The data analysis here reveals that the rate of growth of short-term direct institutional outstanding credit to agriculture has increased over time. During the pre-reform period, the short-term credit was increased by more than seven times from ₹ 1,377 crore in 1975-76 to ₹ 10,002 crore in 1990-91, with compound annual growth rate (CAGR) of 16.34 per cent. Its flow has further increased tremendously during the post-reform period and rose by more than 25 times to ₹ 2,56,256 crore in 2009-10. But inspite of the tremendous increase in the flow of short-term credit during the reform period the CAGR of short-term credit i.e., 15.39 per cent, was less as compared to pre-reform period's CAGR. On the other hand, the growth of long-term

institutional outstanding credit has increased by more than eight times during the pre-reform period, from ₹ 1,772 crore in 1975-76 to ₹ 19,313 crore in 1990-91 with CAGR of 17.55 per cent, which shows somewhat better growth rate as compared to the short-term credit flow during the pre-reform period. During the reform period, although the long-term credit increased tremendously and rose by around nine times to ₹ 1,81,942 crore in 2009-10 but the annual growth showed a decline of 14.65 per cent. In short, during the post-reform period the compound annual growth rate of both short and long-term institutional outstanding credit was less impressive as compared to the growth of pre-reform period.

Table 4.1:Growth of Direct Institutional Agricultural (Outstanding) Credit in India

(₹ crore)

Year	Short term	Long term	Total credit at current prices	At 2004-05 prices	
				Total	Per Cropped Area(Ten lakh Hectares)
1	2	3	4	5	6
1975-76	1377	1772	3149	23764.90	138.73
1979-80	2814	3568	6382	38291.95	225.79
1984-85	5006	8670	13676	52851.27	299.73
1990-91	10002	19313	29315	74471.60	400.95
1994-95	14361	26378	40738	67765.67	360.36
1999-00	31659	49724	81383	104907.34	556.83
2004-05	86259	104791	191050	191050.00	997.39
2009-10	256256	181942	438198	335013.76	1731.70
Compound Annual Growth Rate (%)					
1975-76 to 1990-91	16.34	17.55	17.18	9.55	9.12
1991-92 to 2009-10	15.39	14.65	15.03	7.27	6.84
1975-76 to 2009-10	15.14	13.89	14.47	6.67	6.24

Source: Handbook of Statistics on the Indian Economy2011-12,Reserve Bank of India.

The growth of total direct institutional outstanding (short and long-term)credit to agriculture has been significant over the period. It made a significant jump of ₹ 3,147crore in 1975-76 to ₹ 29,315crore in 1990-91, with CAGR of 17.18 per cent. But the performance goes down during the post-reform period, with CAGR of 15.03

per cent. The CAGR of the total direct institutional outstanding agricultural credit at current price for the above taken period is 14.47 per cent (Appendix Table 3).

To neutralize the inflation effect, the direct institutional outstanding credit to agricultural was deflated at 2004-05 prices. The CAGR of deflated direct institutional outstanding credit to agricultural during the pre-reform period was higher than the CAGR of the same during the post-reform period. This made the overall CAGR to 6.67 per cent. The direct institutional outstanding credit to agriculture for per ten lakh cropped hectares of gross cropped area at 2004-05 prices grew from ₹ 139 crore in 1975-76 to ₹ 401crore in 1990-91 which further increased to ₹ 1,732 crore in 2009-10. The estimated CAGR was 9.12 per cent during the pre-reform period which was higher than the CAGR of 6.84during the post-reform period. The overall CAGR for the above mentioned period was 6.24 per cent.

4.3. Credit Flow to Agriculture: From Different Types of Credit Institutions

In India a multi-agency approach comprising co-operative banks, scheduled commercial banks and regional rural banks has been followed for purveying credit to agriculture. Table 4.2 reveals the distribution share of different institutional agency for agricultural credit to the total of direct and indirect institutional outstanding credit to agriculture since the inception of regional rural banks. Co-operatives which have a long history in India had the highest share to the total agricultural institutional outstanding credit as compared to other agencies during mid-1970s.It accounted for more than half of the total institutional outstanding credit to agriculture contributing 64.83 per cent. On the other side, the institutional outstanding credit by SCBs was significant but the RRBs which entered the business in the mid-1970s, contributed nil to the total institutional outstanding credit to agriculture sector in 1975-76. After that the performance of the co-operative declined continuously from more than half of the total institutional outstanding credit to agriculture sector in 1979-80 to little more than one-third of the total institutional outstanding credit to agriculture at the end of the pre-reform period (1990-91).On the contrary, the share of SCBs to the total institutional outstanding credit to agriculture rose continuously from more than one-third of the total institutional outstanding credit to agriculture in 1979-80 to nearly

half of the total institutional outstanding credit to agriculture in 1990-91. The RRBs share was almost negligible during the entire pre-reform period.

Table 4.2: Distribution of Total Outstanding Credit to Agriculture by Different Types of Lending Institutions

(₹ crore)

Year	Loan Outstanding (as a percentage of Total)			
	Co-operatives	Scheduled Commercial Banks	Regional Rural Banks	Total
1	2	3	4	5
1975-76	2594 *(64.83)*	1092 *(27.29)*		4001 *(100.00)*
1979-80	4193 *(50.81)*	3097 *(37.53)*	181 *(2.19)*	8252 *(100.00)*
1984-85	8562 *(44.98)*	8072 *(42.41)*	726 *(3.81)*	19035 *(100.00)*
1990-91	12886 *(34.45)*	18221 *(48.71)*	1777 *(4.75)*	37408 *(100.00)*
1994-95	33327 *(50.23)*	23786 *(35.85)*	3042 *(4.59)*	66345 *(100.00)*
1999-00	109311 *(62.85)*	46410 *(26.68)*	6020 *(3.46)*	173930 *(100.00)*
2004-05	188954 *(52.73)*	131590 *(36.72)*	16709 *(4.66)*	358315 *(100.00)*
2009-10	235956 *(31.75)*	460990 *(62.03)*	46282 *(6.23)*	743228 *(100.00)*

Note: Total Outstanding credit excluding the data of Rural Electrification Corporation Ltd. (REC) of Indirect Outstanding credit.

Source: Handbook of Statistics on the Indian Economy2011-12, Reserve Bank of India.

During the post-reform period the total institutional outstanding credit to agriculture increased substantially especially after late 1990s. The share of co-operative banks to the total institutional outstanding credit to agriculture increased substantially from 34.45 per cent in 1990-91 to 50.23 per cent in 1994-95. This tremendous increase in the share of co-operatives was because, since 1993-94 many defaulters became non-defaulters with the implementation of Agricultural and Rural

Debt Relief (ARDR) Scheme[8] resulting in an increase in the assistance from banks, increases in the awareness and consequent improvement in the data maintenance and reporting system at the field level resulting in an increase in the amount of loans reported in subsequent years. Its share further increased to 62.85 per cent in 1999-00andafterwards its share to the total institutional outstanding credit had fallen from 52.73 per cent in 2004-05 to 31.75 per cent in 2009-10. On the other side the share of SCBs to the total institutional outstanding credit to the agriculture during the post-reform period fell from 35.85 per cent in 1994-95 to 26.68 per cent in 1999-2000. After that its share increased considerably from 36.72 per cent in 2004-05 to 62.03 per cent in 2009-10 (around four times increased during the five years from 2004-05 to 2009-10). One of the reason for this massive increase in the contribution of SCBs to the agricultural credit was because of the "doubling of agricultural credit policy"(DACP)[9]which helped substantially to increase in SCBs share to agricultural credit due to the high growth of 35.61 per cent per annum achieved by them during 2004-05 to 2006-07 (Mehrotra, 2011). As far as the share of RRBs to the total institutional outstanding credit to agriculture during the post-reform period is concerned, it was 4.59 per cent in 1994-95 which fell to 3.46 per cent in 1999-00.In 2004-05 its share increased to 4.66 per cent and further increased to 6.23 per cent in 2009-10.

Overall share of co-operative credit to the total institutional outstanding credit to agriculture during the reform period was more than at the end of the decade of 1990s but after 1999-2000 it fell continuously. On the other hand, the share of SCBs to the total institutional outstanding credit to agriculture during the reform period was fluctuating up to year 1999-2000 and after that it started to rise and contributed more than half of the total institutional outstanding credit to agriculture during the year 2009-10. The share of the RRBs to the total institutional outstanding credit to agriculture has increased marginally during the post-reform period (Appendix Table-4).

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8 Agricultural and Rural Debt Relief Scheme was announced in the central budget 1990-91. The scheme came into force from May 15, 1990. It was introduced for providing debt relief up to C 10,000 including overdue interest to all the borrowers of public sector banks and regional rural banks (For banks in the co-operative sector, a scheme on similar pattern was put into operation by state governments) who engaged in agriculture and allied activities, artisans engaged in any activity of rural development relating to cottage and village industry, handicrafts, weaving, etc.

9 In June 2004,Government of India announced a credit package to double the flow of institutional credit to agriculture over a period of three years starting from 2004-05 and 30 per cent growth of credit flow to agriculture every year thereafter.

To find the variability of the different institutional agencies to the total of direct and indirect institutional outstanding credit to agriculture (short-term and long-term) during both pre-and post-reform period and its total, the co-efficient of variation (CV) method is used. Table 4.3 shows that the CV of co-operatives and SCBs has higher variability during the post-reform period as compared to the pre-reform period whereas the opposite is happening in RRBs whose variability is higher during the pre-reform period as compared to the post-reform period. Due to high variability of the two agencies i.e., co-operative and SCBs during the post-reform period, the total variability is higher during the post-reform period as compared to the pre-reform period.

Table 4.3: Estimation Results of the Co-efficient of Variation

(Per cent)

Co-efficient of Variation	1975-76 to 1990-91	1991-92 to 2009-10	1975-76 to 2009-10
Co-operatives	48.50	65.02	121.39
Scheduled Commercial Banks	73.85	107.81	164.32
Regional Rural Banks	98.04	96.90	154.78
Total	63.89	80.78	135.55

If we compare the total variability of the three agencies during the whole taken period the SCBs variability is higher next to RRBs. The co-operatives variability is less as compared to both the SCBs and RRBs variability.

4.4. Growth Rate Analysis: For Co-operative Banks, Scheduled Commercial Banks and Regional Rural Banks

Model C[10] represents the estimation of growth rate equation and value of compound annual growth rate (r) of the agricultural institutional outstanding credit by co-operatives during the period 1975-76 to 2009-10. On the other hand, Model D estimates the parameters of variable '(1-D)*t' which shows the growth trend of the

10 Same methodology which the study used in the earlier section of this chapter.

co-operatives during the pre-reform period (1975-76 to 1990-91) and parameter of 'D*t' represents the growth trend during the post-reform period (1991-92 to 2009-10).

Model C:

$\ln x_t = 7.55 + 0.14\,t$

(0.00) (0.00)

$R^2 = 0.97, N = 35$

Model D:

$\ln x_t = 7.70 + 0.12\,(1\text{-}D)^*t + 0.14\,D^*t$

(0.00) (0.00) (0.00)

$R^2 = 0.98, N = 35$

Note: Bracketed figures refer to '*P*' values

Estimated models show that the trend of growth of agricultural institutional outstanding credit during the entire taken period as well as during the pre and post-reform period was positive and significant as shown by the corresponding *P* values. Significant *P* values together with high R^2 in both the models show better fit of the model. Model D reports the compound annual growth rate during pre and post-reform period. The compound annual growth rate during the entire taken period was 15.62 per cent which was significantly contributed by the growth rate during the post-reform period (15.10 per cent) as compared to the pre-reform period (13.17 per cent).

Model Estimates the growth rate equation and value of compound annual growth rate for agricultural outstanding credit by the scheduled commercial banks during the period 1975-76 to 2009-10. For decomposition of the growth rate for pre and post-reform period study depends on Model F which is better model as described in methodology.

Model E:

$\ln x_t = 7.20 + 0.15\,t$

(0.00) (0.00)

$R^2 = 0.98, N = 35$

Model F:

$\ln x_t$ = 6.90 + 0.20 (1-D)*t + 0.16 D*t

(0.00) (0.00) (0.00)

$R^2 = 0.99$, N = 35

Note: Bracketed figures refer to '*P*' values

Estimated Model E shows that the trend of growth in the agricultural outstanding credit was positive and significant as shown by the *P* value of estimated coefficient of variable t. Both the estimated parameters of (1-D)*t and D*t are significant as shown by the corresponding *P* values. *P* value of estimated parameters and the R^2 of the model show better fit and also appropriateness of semi-logarithmic model for calculating annual growth. The corresponding compound annual growth rate value for the Model E period was 16.75 per cent. The figures in Model F are respectively shown the compound annual growth rate for pre-reform period was 21.92 per cent and for post-reform period it was 17.82 per cent. The finding shows that the compound annual growth rate during the post-reform period were less impressive than the pre-reform period's growth.

The Model G describes the estimation of the growth rate equation and value of compound annual growth rate for agricultural outstanding credit by Regional Rural Banks during the period 1975-76 to 2009-10. For decomposition the growth rate for pre and post-reform period study rely on Model H which is a better model as described in methodology.

Model G:

$\ln x_t$ = 5.37 + 0.17 t

(0.00) (0.00)

$R^2 = 0.98$, N = 31

Model H:

$\ln x_t$ = 5.07 + 0.23 (1-D)*t + 0.18 D*t

(72.94) (22.92) (54.90)

$R^2 = 0.99$, N = 31

Note: Bracketed figures refer to *P* values

Estimated model shows that the trend of growth in the agricultural outstanding credit was positive and significant as shown by the *P* value of estimated coefficient of variable t. And also both the estimated parameters of (1-D)*t and D*t are significant as shown by the corresponding *P* values. *P* value of estimated parameters and the $R^2$of the model shows better fit and also appropriateness of semi-logarithmic model for calculating annual growth. The Model G represents that compound annual growth rate of the regional rural bank during entire taken period which is 18.35 per cent. During the pre-reform period in Model H, the compound annual growth rate of the regional rural bank was 25.40 per cent which is better than the growth rate during the post-reform period (19.68 per cent).

From the estimated results of the three different institutions i.e., Cooperatives, SCBs and RRBs, the study found that during the post-reform period the compound annual growth rate of RRBs (19.68 per cent) was higher as compared to the growth of SCBs (17.82 per cent) and cooperatives (15.10 per cent).

4.5. Region-wise Distribution of Institutional Credit to Agriculture

This section tries to analyse the supply of institutional outstanding credit by scheduled commercial banks to agriculture during the post-reform period in different regions of India. In our analysis the country is divided into six regions, namely, Northern Region, North-Eastern Region, Eastern Region, Central Region, Western Region and Southern Region. The Northern Region includes the States and Union Territories viz., Jammu & Kashmir, Himachal Pradesh, Rajasthan, Haryana, Punjab, Delhi and Chandigarh. Assam, Manipur, Meghalaya, Mizoram, Arunachal Pradesh, Nagaland and Tripura States constitute the North-Eastern Regions[11]. The state and Union Territories viz., Bihar, Jharkhand, West Bengal, Orissa, Sikkim and Andaman & Nicobar are included in Eastern Region. The Central Region comprises the States of Uttar Pradesh, Uttarakhand, Madhya Pradesh and Chattisgarh. Western Region is the combination of the States and Union Territories of Gujarat, Maharashtra, Goa, Daman & Diu and Dadra & Nagar Haveli. Lastly, Southern Region consists of the States and Union Territories of Andhra Pradesh, Karnataka, Tamil Nadu, Kerala, Lakshadweep and Pondicherry.

11 Sikkim state was included in North-Eastern Region until 2002.

It has been noted in the above analysis that the growth rate of total institutional outstanding credit to agriculture by SCBs has considerably declined during the post-reform period as compared to the pre-reform period. In this section the study tries to find the distribution and variation in the growth of institutional outstanding credit to agriculture amongst the different regions of the country by SCBs. For the analysis of regional distribution of institutional credit to agriculture, the country India has divided into five regions namely Northern, North-Eastern, Eastern, Central, Western and Southern.

Table 4.4:Region-wiseCompoundAnnual Growth Rates (%) of Institutional Outstanding Credit to Agriculture by Scheduled Commercial Banks

(Per cent)

Region	1992-2000	2001-2010	1992-2010
Northern	12.22	29.36	22.68
North-Eastern	2.92	27.26	11.68
Eastern	8.22	27.82	18.06
Central	8.13	28.65	18.93
Western	16.10	24.39	20.75
Southern	12.21	28.89	19.01
India	**11.70**	**27.98**	**19.85**

Note: The compounded annual growth (CAGR) rate has been calculated by using the semi-log model such as:

$lnY_t = \beta_1 + \beta_2 t + u_t$, where, β_1 and β_2 are parameters, t measures the time period and μ_t is the error term. After estimating the above regression model, annual growth rate (over a period of time) has been calculated by the following way, namely, *Compound Annual Growth Rate = (Antilog of the estimated* β_2 *- 1)*100.* The same procedure has been applied to calculate the growth rates in the further section wherever they are required in this chapter.

Source: Statistical Tables Relating to Banks in India, various issues, Reserve Bank of India and Money and Banking, CMIE Report, October 1999.

Table 4.4 provides the growth rates of agricultural institutional outstanding credit by SCBs for the post-reform period (1992-2010) in all five regions of India. It also provides growth rates for credit to agriculture for two sub-periods, viz., 1992-2000 (early post-reform period) and 2001-2010 (later post-reform period). There have been wide variations in the growth rate during the early post-reform period and later post-reform period. Total institutional outstanding credit to agriculture by SCBs in all the regions grew at the rate of 11.70 per cent during the early post-reform period which is lower than the growth rate of 27.98 per cent during the later post-reform period. During the entire post-reform period agricultural institutional outstanding

credit grew at the rate of 19.85 per cent. This clearly shows that the rate at which agricultural institutional outstanding credit disbursed by SCBs has increased during the later post-reform period (Appendix Table 5).

This pattern can be observed in all the regions. A comparison of growth rates of institutional outstanding credit to agriculture by SCBs in between the early and later post-reform periods reveals that all the regions register higher growth rates of agricultural credit during the later post-reform period as compared to the early post-reform period (Table 4.4).

However, there is much regional variation. The growth rates of agricultural institutional outstanding credit are much higher in the case of North-Eastern, Eastern and Central regions during the later post-reform period. The growth rate in these regions is lower than the all India growth rate of agricultural institutional outstanding credit during the early post-reform period. But the increase in the growth rates is very steep in the case of North-Eastern region. Thus the growth rate of agricultural institutional outstanding credit is uneven across the sub-periods as well as across the regions. During the entire post-reform period the growth rate of agricultural institutional outstanding credit is higher in Northern and Western regions as compared to the growth rate at all India level. On the other hand, the growth rate of the North-Eastern region is less impressive as compared to the other regions of the country during the entire post-reform period.

Inter-regional disparities in the advances of agricultural institutional outstanding credit by SCBs are examined by estimating the coefficient of variation (CV) across the regions. Table 4.5 shows that magnitude of CV at all India level in the advances of agricultural institutional outstanding credit during the post-reform period. It is 110.49 per cent.

However the magnitude of CV for inter-regional variations in the advances of agricultural institutional outstanding credit is higher in the case of Northern region whose variations are more than the variations at all India level. The North-Eastern region has less variability as compared to the other regions of the country next to Western region (Appendix Table 5). This can be proved from the findings of various studies of Giri and Gupta (1988), Dadibhavi (1988), Sarap (1991), and Puhazhendhi

and Jayaraman (1999) in which there is an inter-regional inequality in the distribution of institutional credit to agricultural sector.

Table 4.5: Region-wise Advances of Institutional Outstanding Credit to Agriculture by Scheduled Commercial Banks

(₹crore)

Region	1991-92	1995-96	2000-01	2005-06	2009-10	CV (%)
Northern	3536	4704	12431	47387	109442	**116.79**
North-Eastern	407	342	465	1066	3086	**95.38**
Eastern	2277	2638	5094	16945	40603	**108.07**
Central	3600	4307	7975	28800	71112	**110.93**
Western	3074	4462	13670	29607	73588	**106.25**
Southern	7347	11035	19676	68168	165492	**110.13**
India	**20241**	**27488**	**59310**	**191973**	**463323**	**110.49**

Note: Figures in brackets indicate the percentage share of the region in all-India.

Source: Statistical Tables Relating to Banks in India, various issues, Reserve Bank of India and Money and Banking, CMIE Report, October 1999.

4.6. Size-wise Distribution of Institutional Credit to Agriculture

The Reserve Bank of India publishes data on loans provided to cultivators classified by the size of operational holdings. Cultivators operating less than 2.5 acres are referred to as "marginal" cultivators, between 2.5 and 5 acres are referred to as "small" cultivators and above 5 acres are referred to as "big"[12] cultivators.

Table 4.6 shows the distribution of direct institutional outstanding credit (short and long-term) to farmers according to the size of land holdings during the last two decades (post-reform period). The Table describes that during the decade of 1990s the share of credit obtained by marginal and medium/large farmers in the total agricultural outstanding credit was declined marginally whereas the share of credit obtained by small farmers was increased. However during the later period of the post-reform era i.e., from 2001 to 2010 the opposite was happening. The proportion of credit disbursed to marginal farmers was increased substantially and a marginal increase in the share of small farmers is observed. At the same time, there was a substantial decrease in the share of credit obtained by medium/large farmers. But still

12 "Big" cultivators consist of both medium and large farmers.

the proportion of credit disbursed to medium and large farmers is almost half of the credit disbursed to agriculture. This proves that the institutional agencies in India preferred to lend to better-off farmers. Das *et al* (2009) in their study found that during the last three decades the agricultural credit was not only obtained by the small and marginal farmers for survival but also by the large farmers for enhancing their income (Das, Senapati and John, 2009).

Table 4.6: Distribution of Direct Finance (Short and Long-Term) to Farmers According to Size of Land Holdings by Scheduled Commercial Banks (Outstanding)

(₹Crore)

Year	Loan Outstanding (as a percentage of Total)			
	Marginal (Up to 2.5 Acres)	Small (Above 2.5 acres to 5 Acres)	Medium and Large (Above 5 Acres)	Total
1991-92	3239 *(24.20)*	3050 *(22.85)*	7058 *(52.88)*	13347 *(100.00)*
1995-96	4326 *(24.19)*	4295 *(24.01)*	9265 *(51.80)*	17886 *(100.00)*
2000-01	7215 *(22.91)*	7308 *(23.21)*	16963 *(53.87)*	31486 *(100.00)*
2005-06	29719 *(26.60)*	29255 *(26.18)*	52769 *(47.22)*	111743 *(100.00)*
2009-10	77952 *(28.83)*	72916 *(26.97)*	119500 *(44.20)*	270368 *(100.00)*
CAGR (%)				
1992-2000	8.54	10.24	9.64	9.55
2001-2010	32.02	30.45	25.91	28.60
1992-2010	19.83	19.99	17.67	18.80
C.V.	**117.92**	**114.56**	**102.52**	**109.68**

Note: Figures in brackets indicate the percentage share of the region in all-India.

Source: Handbook of Statistics on the Indian Economy 2011-12, Reserve Bank of India.

However, during the decade of 1990s the growth of all size-classes of farmers was less impressive as compared to the growth of the same during the decade of 2000s. This brought the compound annual growth rate to 19.83 per cent in the case of marginal farmers, 19.99 per cent for small farmers and 17.67 per cent for medium/large farmers during the post-reform period. As far as the variability in the

disbursement of credit to all size-classes of farmers during the post-reform period is concerned, the disbursement of credit to medium and large farmers had higher variability as compared to the variability in the disbursement of credit to marginal and small farmers (Appendix Table 6).

The changes in the distribution of loan accounts under direct finance held by marginal, small and medium/big farmers during the period 1991-92 to 2009-10 (reform period) are shown in Table 4.7.It reveals that the proportion of accounts held by marginal farmers declined from 42.79 per cent in 1991-92 to 35.21 per cent in 2009-10, while that held by medium and large farmers increased from 25.89 per cent in 1991-92 to 35.89 per cent in 2009-10. The proportion of accounts held by the small farmers had increased during the early decade of post-reform period but started to decline during the decade of 2000s. This suggests that more than one-third of credit from banks were obtained by the medium and large size farmers (above 5 acres of land) as compared to marginal and small farmers (Appendix Table 7).

Table 4.7: Distribution of Number of Loan Accounts under Direct Outstanding Finance (Short and Long-term Loans) to Farmers According to Size of Land Holdings by Scheduled Commercial Banks

(₹ Thousand)

Year	Marginal (Up to 2.5 Acres)	Small (Above 2.5 acres to 5 Acres)	Medium and Large (Above 5 Acres)	Total
1991-92	6063 (42.79)	4439 (31.33)	3669 (25.89)	14170 (100.00)
1995-96	5557 (41.87)	4255 (32.06)	3461 (26.08)	13273 (100.00)
2000-01	4600 (38.84)	3689 (31.15)	3555 (30.02)	11844 (100.00)
2005-06	8239 (38.80)	6677 (31.44)	6321 (29.76)	21237 (100.00)
2009-10	17321 (35.21)	14220 (28.90)	17657 (35.89)	49198 (100.00)
CAGR (%)				
1992-2000	-4.16	-2.10	-1.44	-2.77
2001-2010	15.64	15.67	18.70	16.62
1992-2010	4.83	5.45	6.95	5.65
C.V.	**47.23**	**49.35**	**67.06**	**53.56**

Note: Figures in brackets indicate the percentage share of the region in all-India.

Source: Handbook of Statistics on the Indian Economy2011-12, Reserve Bank of India.

On one hand, the growth in the distribution of loan accounts under direct finance held by medium/big farmers were higher as compared to the growth of marginal and small farmers during the post-reform period although a negative growth was observed during the decade of 2000s. On the other hand, the loan accounts held by the medium/large farmers had higher variability as compared to the marginal and small farmers during the post-reform period. Thus in 2000s, there was clear shift in the direct agricultural lending of banks away from small borrower accounts in favour of large-sized loan accounts (Ramakumar and Pallavi, 2007).

Table 4.8: Distribution of Amount Outstanding under Total (Direct and Indirect) Agricultural Advances by Scheduled Commercial Banks According to Size of Credit Limit

(Per cent)

Credit Limit Size	Share of Amount Outstanding in Total Amount Outstanding				
Class of Loans (C)	1991-92	1995-96	2000-01	2005-06	2009-10
Less than 25,000					
Total	55.23	49.48	32.73	13.31	6.44
Direct	61.34	57.15	38.56	18.08	8.11
Indirect	9.80	5.15	2.27	0.94	1.21
25,000 to 2 lakh					
Total	25.69	25.38	33.29	31.41	35.50
Direct	28.35	29.07	38.66	42.70	44.89
Indirect	5.94	4.09	5.21	2.19	5.68
2 lakh to 10 lakh					
Total	4.04	5.79	12.53	19.68	22.99
Direct	3.57	5.99	13.90	25.48	28.40
Indirect	7.53	4.62	5.38	4.66	5.77
10 lakh to 1 crore					
Total	6.82	7.65	5.97	6.08	7.17
Direct	2.55	3.72	3.80	4.78	6.24
Indirect	38.53	30.30	17.29	9.46	10.11
1 crore to 10 crore					
Total	5.10	6.86	6.50	8.46	6.53
Direct	2.22	3.25	3.33	4.11	4.39
Indirect	26.52	27.69	23.03	19.72	13.33
10 crore to 25 crore					
Total	3.12*	4.85*	2.17	4.28	2.80
Direct	1.96*	0.82*	0.60	2.23	1.90
Indirect	11.68*	28.14*	10.39	9.57	5.67
Above 25 crore					
Total			6.82	16.78	18.58
Direct			1.16	2.61	6.08
Indirect			36.42	53.46	58.22
Total Advances	100.00	100.00	100.00	100.00	100.00
Direct	100.00	100.00	100.00	100.00	100.00
Indirect	100.00	100.00	100.00	100.00	100.00

Note: *The data are not separately available for the corresponding size-classes

Source: Basic Statistical Returns, Reserve Bank of India, various issues.

Table 4.8 provides the distribution of outstanding credit to agricultural (direct and indirect) by credit limit size-classes of loans for the period 1991-92 to 2009-10. In case of agricultural loans with credit limit of less than ₹ 25,000, their share to the total agricultural advances had continuously and significantly fallen from 55.23 per cent in 1991-92 to 38.56 per cent in 2000-01, which drastically fell to 6.44 per cent in 2009-10. This was because of the tremendous decline in the share of direct agricultural advances. The share of indirect advances to the same credit limit size had also fallen during the post-reform period and reaches to a meagre share of 1.21 per cent in 2009-10.The share of total advances with credit limit between ₹ 25,000 and ₹ 2 lakh had increased from 25.69 per cent in 1991-92 to 33.29 per cent in 2000-01 which further increased to 35.50 per cent in 2009-10. This increase is also because of the increase in the share of direct agricultural advances to the same credit limit size. In other words, around half of the direct finance to agriculture was accounted for by loans with a credit limit between ₹ 25,000 and ₹ 2 lakh in 2009-10.

As far as the share of credit limit size in between ₹ 2 lakh and ₹ 10 lakh is concerned, it increased continuously during the reform period and reaches to 22.99 per cent in 2009-10 from a meagre share of 4.04 per cent in 1991-92. Here the increase in total credit was also because of the increase in the share of direct agricultural advances which increased to 28.40 per cent in 2009-10 from 3.57 per cent in 1991-92. During the same period the share of indirect agricultural advances was not significant and fluctuating. In 1991-92, the share of the credit limit size in between ₹ 10 lakh and ₹ 1 crore to the total agricultural advances was only 6.82 per cent which was contributed by the share of direct (2.55 per cent) and indirect (38.53 per cent). The total credit share to the same credit size limit further fell in to 5.97 per cent in 2000-01, contributed by 3.80 per cent and 17.29 per cent share of direct and indirect advances to agriculture. It increased to 7.17 per cent in 2009-10 with the contributive share of direct (6.24 per cent) and indirect (10.11 per cent) respectively.

In the credit limit size of ₹ 1 crore and ₹ 10 crore, the share of total advances to agriculture was a meager with 5.10 per cent in 1991-92 which further increased to 6.50 per cent in 2000-01.In 2009-10, the share increased marginally to 6.53 per cent in 2009-10. The majority of the share was contributed by indirect advances with 26.52 per cent in 1991-92, 23.03 per cent in 2000-01 and 13.33 per cent in 2009-10 as compared to the meagre share of the direct advances with2.22 per cent in 1991-92,

3.33 per cent in 2000-01 and 4.39 per cent in 2009-10. The indirect share has contributed majority to the total agricultural advances during the same period. As far as the credit limit in between ₹ 10 crore to ₹ 25 crore is concerned, the share to total agricultural advances was 3.12 per cent in 1991-92 which is contributed by the share of direct advances of 1.96 per cent and the share of indirect advances of 11.68 per cent. The share of total advances further fell to 2.17 per cent in 2000-01 and a meagre increased during 2009-10 with the share of 2.80 per cent. This fluctuating share was mainly contributed by the share of indirect advances as compared to the share of direct advances during the same period which was 10.39 per cent in 2000-01 and 5.67 per cent in 2009-10. The share of amount under total (direct and indirect) agricultural advances according to the credit limit size of above ₹ 25 crore had increased continuously. It increased from 6.82 per cent in 2000-01 to 16.78 per cent in 2005-06 which further increased to 18.58 per cent in 2009-10. Out of this, the share of direct advances was a meagre of 1.16 per cent in 2000-01, which increased to 2.61 per cent in 2005-06 and 6.08 per cent in 2009-10 whereas the share of indirect advances increased from 36.42 per cent to 53.46 per cent and to 58.22 per cent respectively during the above given periods (Table 4.8).

The entire growth of indirect finance to agriculture in the 2000s originated from a major expansion of loans with a credit limit of more than ₹ 10 crore, and particularly, more than ₹ 25 crore. It seems likely that these large loans were advanced towards financing the new activities added, which increasingly favours the growth of capital-intensive and export-oriented production pattern of agriculture to the definition of indirect advances since the late of 1990s. There is little evidence to argue that the major beneficiaries of the revival in agricultural credit in the recent years have been the small and marginal farmers (Ramakumar and Pallavi, 2007).

The percentage share of number of loan accounts according to the size of credit limit under total (direct and indirect) agricultural advances is shown in Table 4.9. In the case of the number of loan accounts for the credit limit size of less than ₹ 25,000, the proportion of loan accounts to total loan accounts was 97.12 per cent in 1991-92, declined to 82.79 per cent in 2000-01 and further declined to 42.60 per cent in 2009-10. This decline was because of the tremendous fall in the share of direct and indirect loan accounts to total loan accounts of the same credit limit size as shown in below Table. The decline in the share of direct loan accounts was drastic during the

reform period. It was 99.63 per cent in 1991-92, fell to 83.01 per cent in 2000-01 which further declined drastically to 39.98 per cent in 2009-10 for the same credit limit size.

Table 4.9: Distribution of Loan Accounts under Total (Direct and Indirect) Agricultural Advances by Scheduled Commercial Banks According to Size of Credit Limit

(Per cent)

Credit Limit Size	Share of Amount Outstanding in Total Amount Outstanding				
Class of Loans (C)	1991-92	1995-96	2000-01	2005-06	2009-10
Less than 25,000					
Total	97.12	95.67	82.79	61.24	42.60
Direct	99.63	95.94	83.01	61.31	39.98
Indirect	93.14	89.27	67.21	58.53	40.39
25,000 to 2 lakh					
Total	2.77	4.06	15.92	34.58	56.27
Direct	0.28	4.03	15.78	34.72	53.01
Indirect	5.51	6.99	25.77	28.82	48.57
Above 2 lakh					
Total	0.12	0.27	1.29	4.17	1.13
Direct	0.09	0.04	1.20	3.98	7.02
Indirect	1.35	3.73	7.02	12.60	11.04
Total Advances	100.00	100.00	100.00	100.00	100.00
Direct	100.00	100.00	100.00	100.00	100.00
Indirect	100.00	100.00	100.00	100.00	100.00

Note: The data are not separately available for the corresponding size-classes

Source: Basic Statistical Returns, Reserve Bank of India, various issues.

The share in total loan accounts with credit limit size between ₹ 25,000 and ₹ 2 lakh had increased form 2.77 per cent in 1991-92 to 15.92 per cent at the end of the 1990s decade. It further increased to 56.27 per cent in 2009-10, accounting more than half of the loan accounts for agricultural advances under the same credit limit size. The increase in the share of loan accounts under the same credit limit size was because of the increase in the share of both direct and indirect loan accounts. It was 0.28 per cent of direct loan accounts and 5.51 per cent of indirect loan accounts in 1991-92, which increased to 53.01 of direct and 48.57 per cent of indirect loan accounts in 2009-10. The share of the loan accounts of credit limit size of above ₹ 2

lakh was insignificant during the reform period. Its share was less than one per cent during the decade of 1990s. During 2000s, it was 1.29 per cent in 2000-01, 4.17 per cent in 2005-06 and 1.13 per cent in 2009-10. Out of this, the share of direct loan accounts was 1.20 per cent in 2000-01, increased to 3.98 per cent in 2005-06 and further increased to 7.02 per cent in 2009-10. On the other side, the share of indirect loan accounts to total loan accounts was 7.02 per cent, 12.60 per cent and 11.04 per cent respectively (Table 4.9).

4.7. Conclusions

This chapter analyses the trends and composition of different institutions in the flow of agricultural institutional outstanding credit during the post-reform period in India. The analysis reveals that the trends of institutional outstanding credit to agriculture during the post-reform period were increasing and high as compared to the pre-reform period. However the trends of both direct and indirect institutional outstanding credit during the post-reform period were increasing but the trend of direct institutional credit to agriculture was higher than the trend of indirect institutional outstanding credit to agriculture.

The share of direct short-term institutional outstanding credit continuously fell during the pre-reform period till the end of the1980s. But during the post-reform period the share increased continuously and maintained the share to more than half of the total credit in 2009-10. On the other hand, the share of direct long-term institutional outstanding credit was increasing continuously during the pre-reform period with some fluctuation in late 1970s but after that it increased tremendously up to 1990-91. While during the post-reform period, the share fell continuously to less than 50 per cent in 2009-10.

The analysis found that there is a marginal decline in the growth of agricultural institutional outstanding credit (both direct and indirect) during the post-reform period as compared to the pre-reform periods' growth. The growth of both direct short and long-term institutional outstanding credit to agriculture during the post-reform period is lower as compared to the pre-reform periods' growth. In comparison between short and long-term direct institutional outstanding credit to agriculture during the post-reform period, the growth of short-term is higher as

compare to the growth of long-term credit. The growth of total direct institutional outstanding (short and long-term) credit to agriculture is lower in the post-reform period as compared to the growth of pre-reform period. After neutralizing the inflation effect, it is also found that the growth of direct institutional outstanding credit to agriculture during the post-reform period is lower than the growth of pre-reform periods' growth. The study examines the direct institutional outstanding credit to gross cropped area per ten lakh hectares at 2004-05 prices. Here also, the growth is lower during the post-reform period as compared to the pre-reform period.

Scheduled commercial banks, cooperative banks and regional rural banks (known as multi-agency approach) are the major agencies in which farmers depend on to access institutional credit for agriculture. The share of co-operatives to the total institutional outstanding credit to agriculture during the post-reform period was increasing and contributed more than half at the end of the decade of 1990s but in 2000s it started to fall continuously and contributed less than one-third of the total institutional outstanding credit to agriculture in 2009-10. On the other hand, the share of SCBs to the total institutional outstanding credit to agriculture during the post-reform period was fluctuating till the year 1999-2000 and after that it started to rise and contributed more than half of the total during the end of the decade 2000s. The share of the RRBs to the total institutional outstanding credit to agriculture increased continuously but contributed less than 10 per cent during the post-reform period. During this period, the SCBs outstanding credit to agriculture has higher variability followed by RRBs and co-operatives respectively.

The finding shows that the compound annual growth rate of institutional outstanding credit to agriculture by co-operatives is little better during the post-reform period than the pre-reform period while that of SCBs and RRBs are better during the pre-reform period than the post-reform period. Nonetheless, the compound annual growth rate of RRBs is higher as compared to that of SCBs and co-operatives during the post-reform period.

The supply of institutional outstanding credit to agriculture by SCBs during the post-reform period in different regions of the country has also been analysed in this study. It examines the growth rates in all the regions for credit to agriculture for two sub-periods, viz., 1992-2000 (early post-reform period) and 2001-2010 (later

post-reform period). In all the regions the growth rate is higher during the later post-reform period as compared to the early post-reform period. However, the growth rates are much higher in the case of North-Eastern, Eastern and Central regions during the later post-reform period. But the increase in the growth rates is steep in the case of North-Eastern region. Thus the growth rate of agricultural institutional outstanding credit is uneven throughout the sub-periods as well as across the regions. During the entire post-reform period the growth is higher in Northern and Western regions as compared to the growth rate of all India. On the other hand, the growth rate of the North-Eastern region is less impressive as compared to the other regions of the country during the post-reform period.

The Northern region has higher variability in the distribution of institutional outstanding credit to agriculture by SCBs as compared to the other regions during the post-reform period. On the contrary, the North-Eastern region has least variability as compared to the other regions of the country.

The study also discusses the distribution of direct institutional outstanding credit to farmers by SCBs according to the size of land holdings during the last two decades of post-reform period. During the period of 90s the share of credit obtained by marginal and medium/large farmers declined marginally because of the marginal increase in the share of credit obtained by small farmers. But in period of 2000s the opposite was happening. The proportion of credit disbursed to marginal farmers increased substantially which caused the decline in the share of credit obtained by medium/large farmers. During the same period there was marginal increase in the share of the small farmers. The proportion of credit disbursed to medium/large farmers is still almost half of the credit disbursed to agriculture. However, during the decade of 1990s the growth of all size-classes of farmers is less impressive as compared to the growth of the same during the decade of 2000s. There is higher variability in the disbursement of credit to medium/large farmers as compared to the variability of marginal and small farmers.

The changes in the distribution of loan accounts under direct finance held by marginal, small and medium/big farmers during the post-reform period has also been analysed. The study found that on one hand, the growth in the distribution of loan accounts under direct finance held by medium/big farmers are higher as compared to

the growth of marginal and small farmers during the post-reform period although there is a negative growth during the decade of 2000s. On the other hand, the loan accounts held by the medium/large farmers has higher variability in comparison to the marginal and small farmers during the post-reform period.

The study also provides the distribution of institutional outstanding credit to agriculture by credit limit size-classes of loans during the post-reform period. In the case of agricultural loans with credit limit less than ₹ 25,000, their shares to the total agricultural advances has continuously and drastically fallen during the post-reform period because of the drastic decline in the share of direct agricultural advances. The share of total advances with credit limit between ₹25,000 and ₹ 2 lakh has increased during the post-reform period because of the increase in the share of direct agricultural advances to the same credit limit size. In other words, around half of the direct finance to agriculture was accounted for by loans with a credit limit between ₹ 25,000 and ₹ 2 lakh in 2009-10. The share of credit limit size in between ₹ 2 lakh and ₹ 10 lakh has also increased continuously during the post-reform period. Here the increase in total credit is because of the increase in the share of direct agricultural advances. During the same period the share of indirect agricultural advances is not significant and fluctuating. The share of the credit limit size in between ₹ 10 lakh and ₹ 1 crore to the total agricultural advances fluctuates and less than 10 per cent during the post-reform period even the higher contributory share of indirect agricultural advances. In the credit limit size in between ₹ 1 crore and ₹ 10 crore, the share of total advances to agriculture increased marginally during the reform period even the higher contributory share of indirect agricultural advances. The credit limit in between ₹ 10 crore ₹ 25 crore shares to total agricultural advances was fluctuating with major contribution by the share of indirect advances. The share of ₹ 25 and above crore increased continuously during the post-reform period and contributed a significant share to the total agricultural advances. This growth is because of substantial share of the indirect agricultural advances to the total advances.

The percentage share of number of loan accounts in case of less than ₹ 25,000 declined drastically from almost 98 per cent in the early post-reform period to less than half of the total number of loan accounts at the end of the 2000s. This decline was because of the tremendous fall in the share of direct and indirect loan accounts to total loan accounts. The share in total loan accounts with credit limit size between

₹ 25,000 and ₹ 2 lakh has increased considerably during the post-reform period, accounting more than half of the loan accounts for agricultural advances during the year 2009-10, which were contributed by the increased share of both direct and indirect agricultural credit advances. The share of the loan accounts of credit limit size of above ₹ 2 lakh is insignificant during the post-reform period.

Chapter-5

Impact of Bank Finance on Agricultural Gross Domestic Product

CHAPTER-5

IMPACT OF BANK FINANCE ON AGRICULTURAL GROSS DOMESTIC PRODUCT

India needs to increase its agricultural production to feed the ever increasing population. Many studies have suggested that to increase the agricultural output farmers should have easy access to various inputs like good quality seeds, fertilizers, pesticides, availability of water, etc. To acquire these essential inputs majority of farmers[1] in the country have to rely on the outside sources of finance. This is primarily due to the vicious cycle of low productivity, low income, low saving and low investment in agricultural operation (Mohideen, 1991). The outside sources of finance are the institutional sources which comprises of cooperatives, scheduled commercial banks, and regional rural banks, collectively known as multi-agency network and from the non-institutional sources[2].

There are many obstacles in obtaining credit from institutional sources; hence farmers cannot entirely rely on them for their credit needs. As Singh *et al* observed, the farmers have to make many trips to complete formalities required for obtaining institutional loans and spend extra money other than the interest charged by these agencies, which is approximately negligible in the case of non-institutional sources (Singh, Kaur and Kingra, 2008). Therefore, majority of farmers depend heavily on the non-institutional sources of finance due to low transaction cost, easy access and procedures although they charged high interest rates. The non-institutional sources of finance also lend them for the purpose of consumption, social ceremonies and non-productive purposes as well.

There is realization in most of the developing countries that agricultural credit is an important element in their development, where inflow of funds are seasonal and income and savings of the farmers are low. These farmers therefore require support in the form of institutional credit to take up relevant technologies to improve their farm productivity and income. The introduction of modern technology to agricultural sector

1 More than four-fifth of operational holdings in India are small and marginal farmers.
2 Non-institutional sources of finance are mainly from moneylenders, relatives, friends, commission agents, etc.

in 1960s led to intensive use of inputs, resulting in manifold increase of credit requirement. Ayaz *et al* observed that the easy availability and access to credit provides the farmers ability to diversify agriculture practices by adopting new technology (Ayaz, Anwar, Sial and Hussain, 2011).

For increasing production, farmers must be able to purchase modern inputs such as high-yielding varieties of seeds, fertilizers and irrigation and to achieve this; the availability of easy and cheap credit is the quickest way. This is because the farm income and the expenditure of the farmer do not occur at the same time (Desai and Mellor, 1993). Abedullah *et al.*, emphasized that agriculture sector depends more on credit than any other sector of the economy because of the seasonal variations in the farmers returns and a changing trend from subsistence to commercial farming (Abedullab, Mahmood and Kouser, 2009).

If the institutional credit agencies slow down the provisions of credit facilities, the prospects of output, exports, and food security of the country may be jeopardized (Singh, 2000). This is because with the rise in the price of essential inputs day by day the credit requirements of farmers has increased tremendously. Similarly, Agarwal *et al.*, rightly observed that the agricultural credit system in India has been instrumental in enhancing production and stimulating investment in agriculture (Agrawal, Puhazhendhi and Satyasai, 1997).

Table 5.1 depicts the growth of agricultural gross domestic product and nominal institutional outstanding agricultural credit during the period 1975-76 to 2009-10. The compound annual growth rate of agricultural gross domestic product during pre-reform period, increased from only 6.76 per cent in 1975-76 to 1979-80 to 13.85 per cent in 1985-86 to 1989-90. But during the post-reform period the growth rate has fluctuated and it declined from 14.84 per cent in 1990-91 to 1994-95 to 5.08 per cent in 1999-2000 to 2004-05, which increased to 14.75 per cent in 2005-06 to 2009-10.

Table 5.1 Growth of Agriculture and Institutional (Outstanding) Agricultural Credit (Nominal)

Period	Compound Growth Rate (Per cent)	
	Agricultural Gross Domestic Product	Nominal Credit
1975-76 to 1979-80	6.76	19.87
1980-81 to 1984-85	12.07	17.12
1985-86 to 1989-90	13.85	12.55
1990-91 to 1994-95	14.84	16.43
1995-96 to 1999-00	11.38	20.53
1999-00 to 2004-05	5.08	14.99
2005-06 to 2009-10	14.75	12.59

Note: The compounded annual growth (CAGR) rate has been calculated by using the semi-log model such as: $lnY_t = \beta_1 + \beta_2 t + \mu_t$, where, β_1 and β_2 are parameters, t measures the time period and μ_t is the error term. After estimating the above regression model, annual growth rate (over a period of time) has been calculated by the following way, namely, *Annual Average Growth Rate = (Antilog of the estimated* β_2 *- 1)*100.*

Source: Handbook of Statistics on Indian Economy 2011-12, Reserve Bank of India.

On the other hand the compound annual growth rate of institutional outstanding credit to agricultural during the pre-reform period was declining and it declined from 19.87 per cent in 1975-76 to 1979-80 to 12.55 per cent in 1985-86 to 1989-90. However the growth rate was fluctuating during post-reform period which was 16.43 per cent in 1990-91 to 1994-95, increased to 20.53 per cent in 1995-96 to 1999-2000. Then its growth was started to fallen to 12.59 per cent in 2005-06 to 2009-10 inspite of tremendous increase in the disbursement of institutional outstanding credit to agriculture which is from ₹ 39,976 crore in 1991-92 to ₹ 7,43,228 crore in 2009-10 (Appendix Table 8).

The sectoral deployment of non-food gross bank credit to agriculture sector is presented in Table 5.2. During the period 1980-81 the share of agriculture credit to total non-food gross bank credit was 22.89 per cent which fell drastically to 3.82 per cent in 1989-90. At the end of the 1990s there was some recovery and it reached to 11.07 per cent in 1999-00. The decade of 2000s shows that the share of agriculture credit to the non-food gross bank credit remaining stable between 11 to 14 per cent.

Table 5.2 Sectoral Deployment of Non-Food Gross Bank Credit to Agriculture sector (Outstanding)

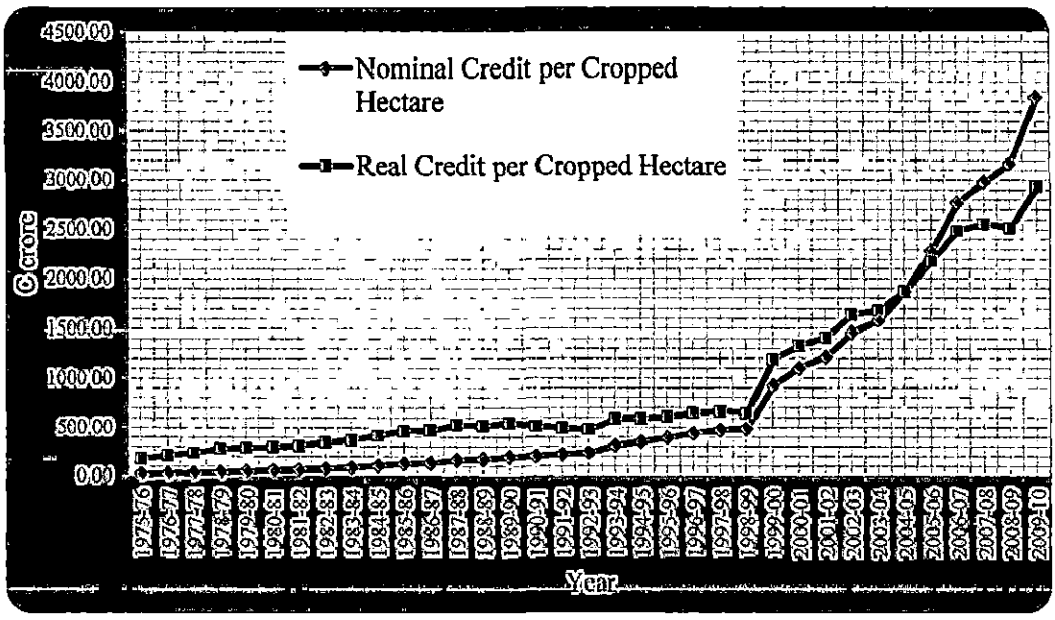
(₹ crore)

Sectors	1980-81	1984-85	1989-90	1994-95	1999-00	2004-05	2009-10
1	2	3	4	5	6	7	8
Non-Food Gross Bank Credit	230	423	1007	1847	3751	9998	30400
Agriculture	36	77	165	240	444	1253	4161
Share of Agriculture in Total (%)	22.89	19.26	3.82	4.22	11.07	12.58	13.47

Source: Handbook of Statistics on Indian Economy, Reserve Bank of India, various issues.

The availability of nominal and real institutional outstanding credit on per cropped hectare over the period 1975-76 to 2009-10 is depicted in Figure 5.1 (Appendix Table 9). The nominal credit was ₹ 23.36 crore per ten lakh cropped hectares in 1975-76 which increased to ₹ 482.92 crore per cropped hectares in 1998-99. During the post-reform period it get double to ₹ 923.20 crore per ten lakh cropped hectares in 1999-2000. It again increased and reached to a level of ₹ 3,841.77 crore per ten lakh cropped hectares in 2009-10.

Fig. 5.1: Nominal and Real Credit per Ten Lakh Cropped Hectares



Source: Handbook of Statistics on the Indian Economy2011-12,Reserve Bank of India.

The real credit per ten lakh cropped hectares (at 2004-05 prices) shows a gradual rising trend during the pre-reform period. It was ₹ 213.53 crore per ten lakh cropped hectares in 1976-77 which increased marginally to ₹ 297.55 crore per cropped hectare in 1980-81 and further to ₹ 515.59 crore per ten lakh cropped hectares in 1988-89. During the post-reform period of the period of 1990-91 to 1992-93, the real credit per ten lakh cropped hectares grew negatively due to high inflation faced by the country. The decade of 1990s shows very little growth of ₹ 584.12 crore and 1,190.05 crore per ten lakh cropped hectares in 1993-94 and 1999-2000 respectively. After 1999-2000 it rose continuously with the exception of the year 2008-09 when it declined marginally.

It can be observed from the figure that both nominal and real institutional outstanding credit per ten lakh cropped hectare has increased smoothly during the pre-reform period whereas during the post-reform period it has increased tremendously especially after 1998-99.This is because of the broadening in the definition of indirect finance by the RBI. In Oct 1993, the RBI broadened the definition of indirect finance and as a result there was a sharp increase in the number of loans with credit limit of ₹ 10 crore and above, particularly, above ₹ 25 crore during 2000s. There was also a shift in the pattern of direct agricultural lending of banks away from small borrower accounts in favour of large-sized loans accounts (Ramakumar and Chavan, 2007).

5.1. Empirical Results and Discussions

The study investigates the impact of IC as an independent variable to dependent AGDP by using Cobb-Douglas production function model. The other explanatory variables used in the estimation are GSA, GIA, AL and FC to find out the input-output relationship (Appendix Table 10). Dummy variable has been taken for pre-reform and post-reform period in the model. These explanatory variables determine the AGDP which are shown in three different models. The study estimates the first model by including all the explanatory variables to define the agricultural gross domestic product. In second model the independent variable of fertilizer consumption and in the third model the gross irrigated area and fertilizer consumption of independent variables will be excluded to reject the null hypothesis.

Table 5.3 models are log linear heteroskedasticity-corrected model[3]. The value

3 The procedure involves (a) OLS estimation of the model of interest, followed by (b) an auxiliary regression to generate an estimate of the error variance, and then finally (c) weighted least

of coefficients measure the per cent change in AGDP with 1 per cent change in explanatory variable. Each input variables contribution in the AGDP can be measured, holding other input constant. While measuring all β coefficients we assume that β_1 (intercept) i.e., technology remains constant.

Table 5.3 Determinants of Agricultural Gross Domestic Product using Cobb-Douglas Production Function Methodology

Variables	Model I	Model II	Model III
Constant	-11.556***	-7.475***	-13.643***
	(0.000)	*(0.009)*	*(0.000)*
lnIC	0.157***	0.085**	0.116***
	(0.000)	*(0.018)*	*(0.000)*
lnALF	1.147***	0.945***	1.350***
	(0.000)	*(0.000)*	*(0.000)*
lnGSA	1.209***	0.966***	1.383***
	(0.000)	*(0.000)*	*(0.000)*
LnRN	0.161***	0.155***	0.167***
	(0.000)	*(0.000)*	*(0.000)*
lnGIA	0.326*	0.346*	
	(0.098)	*(0.050)*	
lnFC	-0.094		
	(0.144)		
D	-0.314	-0.828***	-0.777***
	(0.400)	*(0.000)*	*(0.004)*
D*lnIC	0.030	0.076***	0.071***
	(0.366)	*(0.000)*	*(0.002)*
R^2	**0.99791**	**0.99735**	**0.99518**
F(k, n-k)	**F (8, 26)**	**F (7, 27)**	**F (6, 28)**
	1551.938	**1451.984**	**964.783**
	(0.000)	*(0.000)*	*(0.000)*
D-W (d value)	**1.8938**	**1.7284**	**1.9648**
Phase	**2.296**	**1.745**	**2.310**

Notes: Level of significance ***, **, * are denoted as 1 per cent, 5 per cent and 10 per cent respectively. ***P values*** under brackets denote the probability of the level of significance. ***F*** and ***D-W*** denotes the ***F*** Statistic and Durbin-Watson Statistic respectively, ***Phase*** denotes Returns to Scale.

The above Table presents the results of the regression analysis as Cobb-Douglas production function was used to estimate the coefficient value of explanatory variables to determine agricultural gross domestic product (AGDP). Results in Model I depicts that the expected agricultural gross domestic product (ln AGDP) is -11.56(intercept) which represents that agricultural gross domestic product will be

squares, using as weight the reciprocal of the estimated variance. In the auxiliary regression (b) we regress the log of the squared residuals from the first OLS on the original regressors and their squares. The log transformation is performed to ensure that the estimated variances are non-negative. Call the fitted values from this regression u*. The weight series for the final WLS is then formed as 1/exp (u*). In that context it offers the possibility of consistent standard errors and more efficient parameter estimates as compared with OLS.

negative when there is no explanatory variables (inputs). The coefficient value of institutional outstanding credit (ln IC) during the entire taken period is 0.16, which indicates that it has positive impact on AGDP and remains statistically highly significant. However when we analyse the post-reform period only, the coefficient value of cross product of dummy (economic reforms) and institutional outstanding credit (D*ln IC) is 0.19, which remains statistically insignificant. This signifies that an increase in institutional outstanding credit (input) by one per cent will increase AGDP by 0.19 per cent during the post-reform period.

The results in Model I specifies that the agricultural labour force (ln ALF) and gross sown area (ln GSA) has positive impact on AGDP during the period 1975-76 to 2009-10 and remains statistically highly significant. It implies that a per cent increase in agricultural labour force and gross sown area will increases AGDP by 1.15 per cent and 1.21 per cent respectively. As far as the availability of water through rainfall is concerned, the coefficient value of rainfall (ln RN) is 0.16 and it remains statistically highly significant also which signifies that a one per cent increase in rainfall will increases AGDP by only 0.16 per cent. On the other hand the water availability through irrigation has also a positive impact on AGDP and remains statistically significant at 10 per cent level. The coefficient value of gross irrigated area (ln GIA) of 0.33 implies that a one per cent increase in the gross irrigated area will bring 0.33 per cent increase in the AGDP. However consumption of fertilizers (ln FC) has had negative impact on AGDP and remains statistically insignificant also.

The impact of economic reforms on agricultural gross domestic product is explained with the help of dummy variable. The coefficient value for dummy is -0.31 which signifies that the economic reforms have had a negative impact on AGDP and remains statistically insignificant. As far as the institutional outstanding credit is concerned, the reform period has had a positive impact on AGDP but it remains statistically insignificant.

The overall significance of the Model I can also be understood from the value of the coefficient of multiple determination i.e. R^2. The value of R^2 is 0.9979 which indicates that about 99 per cent of the variation in the (log of) AGDP is explained by the (logs of) all explanatory variables included in the model over the period 1975-76

to 2009-10. The F-calculated value is 1551.938 which is statistically highly significant. The large value of F-statistics shows that the explanatory variables included in the model collectively had significant impact on agricultural gross domestic product. However the low value, i.e., 1.89 of Durbin-Watson test for autocorrelation suggests the presence of autocorrelation. The sum of all the coefficient values of explanatory variables except the intercept term (β_1), gives information about the returns to scale, which is the response of output to a proportionate change in inputs. The estimated model gives Increasing Returns to Scale.

In Model II the explanatory variable of fertilizer consumption has been excluded and both fertilizer consumption and gross irrigated area are excluded from Model III to reject the null hypothesis that the availability of institutional outstanding credit has negative impact on agricultural gross domestic product during the post-reforms period. The result shows that the coefficient value of lnIC has positive impact on AGDP in both the models during the period 1975-76 to 2009-10.It remains statistically significant at 2 per cent level in Model II and statistically highly significant in Model III. This signifies that an increase in institutional outstanding credit by one per cent will increase agricultural gross domestic product by 0.09 per cent and 0.12 per cent in Model II and Model III respectively. During the post-reform period also, the institutional outstanding credit has had a positive impact on AGDP with coefficient values of 0.16 and 0.19 in Model II and Model III respectively and remains statistically highly significant in both the model. It shows that a per cent increase in an institutional outstanding credit during the post-reform period will increases AGDP by 0.16 per cent and 0.19 per cent respectively.

The coefficient values of ln ALF in Model II and Model III (0.95 and 1.35) depicts that it has a positive impact on AGDP which also remains statistically highly significant. In both the model the coefficient values of ln GSA is 0.97 in Model II and1.38 in Model III. This signifies that an increase in gross sown area by one per cent will increase AGDP by 0.97 per cent and 1.38 per cent respectively which remains statistically highly significant. The coefficient values of ln RN in both the model have the value of 0.16 and 0.17respectively which also remains statistically highly significant. Gross irrigated area's coefficient value in Model II indicates that it has positive impact on AGDP and remains statistically significant at 5 per cent level. It implies that a per cent increase in ln GIA will increases AGDP by 0.35 per cent.

The coefficient values of dummy variable in both the model depicts that economic reforms has negative impact on AGDP with coefficient values of -0.83 and -0.78 respectively but both remains statistically highly significant. During the post-reform period, institutional outstanding credit has positive impact on AGDP which is statistically highly significant in both the model.

The high R^2 values suggest that over 99 per cent variations in the agricultural gross domestic product are explained by the explanatory variables included in both the model. The F values are 1451.98 and 964.78 respectively which are statistically highly significant. In both the model, the value of Durbin-Watson test reveals that there is presence of autocorrelation. Both the model shows that agricultural gross domestic product has witnessed Increasing Returns to Scale during the entire period taken under study.

To check the presence of multicollinearity in Table 5.3., the study uses Variance Inflation Factor (VIF). The VIF quantifies the extent of multicollinearity in an OLS regression analysis. It provides an index that measures how much the variance[4] (the square of the estimate's standard deviation) of an estimated regression coefficient is increased because of collinearity. The Table 5.4 here shows the presence of multicollinearity in the estimated models, when the value is less than 1.0 and greater than 10.0.

Table 5.4 Variance Inflation Factor (VIF) for the Models of Table 5.3

Variables	Model I	Model II	Model III
lnIC	136.281	60.042	28.444
lnALF	24.452	24.033	14.921
lnGSA	17.892	17.189	7.572
LnRN	2.055	1.899	1.897
lnGIA	199.350	135.841	
lnFC	165.410		
D	5109.581	1759.590	1388.236
D*lnIC	5626.507	1768.236	1436.703

Note: VIF (j) = 1/ [(1-R (j)^2], where R (j) is the multiple correlation coefficient between variable j and the other independent variables. Minimum Possible value = 1.0 and Values > 10.0 may indicate a collinearity problem

4 In Probability theory or statistics, the variance is a measure of how far a set of numbers is spread out. It is one of several descriptors of a probability distribution, describing how far the numbers lie forms the mean (expected value).

The result of the estimated VIF shows that in Model I all the explanatory variables have multicollinearity problem except the variable of rainfall. Similarly in Model II, all the explanatory variables have multicollinearity problem except rainfall variable. When we excluded the explanatory variables of gross irrigated area and fertilizer consumption to run the Model III, we found that the variables gross sown area and rainfall have no multicollinearity problem with values are less than 10 whereas all the rest of the variables showed the presence of multicollinearity problem.

To overcome the problem of multicollinearity which was present in all the explanatory variables except one or two in all the estimated models in Table 5.3, the study transformed the variables (i.e., the dependent and all the independent variables) into per cultivated ten lakh hectares. Table 5.5 here shows the estimated results of Cobb-Douglas type production function which are heteroskesdasticity-corrected per cultivated ten lakh hectares models.

Table 5.5:The OLS Results of Cobb-Douglas Production Function

Variables	Model I	Model II	Model III
Constant	4.802***	5.649***	2.045***
	(0.000)	*(0.000)*	*(0.160)*
lnphIC	-0.003	0.071	0.338***
	(0.957)	*(0.178)*	*(0.000)*
lnphALF	0.398***	0.280***	0.403*
	(0.000)	*(0.000)*	*(0.058)*
lnphRN	0.336***	0.285***	0.312***
	(0.000)	*(0.000)*	*(0.000)*
lnphGIA	0.593**	0.993***	
	(0.030)	*(0.000)*	
lnphFC	0.160**		
	(0.045)		
D	-0.707**	-0.339	0.611***
	(0.017)	*(0.151)*	*(0.007)*
D*lnphIC	0.128***	0.062	-0.076***
	(0.009)	*(0.109)*	*(0.036)*
R^2	**0.99496**	**0.99370**	**0.99224**
F	**F (7, 27)**	**F (6, 28)**	**F (5, 29)**
	762.1748	**736.8619**	**742.4383**
	(0.000)	*(0.000)*	*(0.000)*
D-W (d value)	**1.65403**	**1.66059**	**1.45120**
Returns to Scale	**0.905**	**1.352**	**1.588**

Notes: Level of significance ***, **, * are denoted as 1 per cent, 5 per cent and 10 per cent respectively. *P values* under brackets denote the probability of the level of significance. ***F*** and ***D-W*** denotes the *F* Statistic and Durbin-Watson Statistic respectively.

The estimated results of Model I illustrates that the institutional outstanding credit has negatively impact on AGDP during the entire taken period and remains statistically insignificant. On the other side if we measure the impact of institutional outstanding credit on AGDP during the post-reform period we find that it has positive impact and remains statistically significant at one per cent level. The coefficient value of the cross product of dummy and institutional outstanding credit (lnph D*IC) is 0.13, which shows that a per cent increase in institutional outstanding credit during the post-reform period increases AGDP by 0.13 per cent.

The analysis shows that the input variable of agricultural labour force (lnphALF) has positive impact on AGDP which can be understood by the coefficient value of 0.40 and it remains statistically highly significant. It denotes that an increase in agricultural labour force by one per cent will increase AGDP by 0.40 per cent. The coefficient value of lnphRN is 0.34which again shows that it has positive impact on AGDP, that is, increase in rainfall by one per cent will increase AGDP by 0.34 per cent and remains statistically highly significant. The coefficient value of gross irrigated area (lnphGIA) also has positive impact on AGDP during the entire taken period and remains statistically significant at 3 per cent level. The coefficient value of gross irrigated area signifies that an increase in gross irrigated area by one per cent will increase AGDP by 0.59 per cent. The explanatory variable fertilizer consumption also has positive impact on AGDP during the period 1975-76 to 2009-10. The coefficient value of lnphFC (0.16) signifies that an increase in the consumption of fertilizer by one per cent will increase AGDP by 0.16 per cent and remains statistically significant at 5 per cent level. The impact of reform on AGDP has been negative with the coefficient value of -0.71 and remains statistically significant at 2 per cent level.

R^2 for the Model I is 0.99, which means log of per cultivated ten lakh hectares of all the explanatory variables included in the model are able to explain about 99 per cent variation of the log of per cultivated ten lakh hectares of agricultural gross domestic product. The large value of F-statistics i.e., 762.18 shows that the explanatory variables included in the model collectively has significant impact on agricultural gross domestic product. The value of d (1.65) represents the presence of autocorrelation in the model. The combined coefficient values of the explanatory

variables which are determinants of AGDP points out that the AGDP has Decreasing Returns to Scale (0.91).

The OLS results in Table 5.5 shows that in both the model that is Model II and III, the institutional outstanding credit has positive impact on agricultural gross domestic product during the period 1975-76 to 2009-10 but remains statistically insignificant in Model II and statistically highly significant in Model III. This can happen when the study excluded the explanatory variables of fertilizer consumption in Model II and both fertilizer consumption and gross irrigated area in Model III. The coefficient values of lnphIC are 0.07 and 0.34 which indicates that a per cent increase in institutional outstanding credit will increase AGDP by 0.07 per cent and 0.34 per cent in Model II and Model III respectively during the entire taken period. But during the post-reform period, the impact of institutional outstanding credit on AGDP is positive in Model II and negative in Model III which remains statistically insignificant in Model II and statistically significant at 4 per cent level in Model III. The coefficient values of 0.06 in Model II and -0.08 in Model III shows that a per cent increase in institutional outstanding credit during the post-reform period increases AGDP by 0.13 per cent in Model II and decreases by 0.08 per cent in Model III respectively.

Again in both the models agricultural labour force (lnphALF) has positive impact on AGDP and remains statistically highly significant in Model II and statistically significant at 6 per cent in Model III. The coefficient value of lnphALF denotes that an increase in agricultural labour force by one per cent will increases AGDP by 0.28 per cent and 0.40 per cent respectively during the entire taken period. The coefficient value of lnphRN is 0.29 and 0.31 in Model II and III, and remains statistically highly significant in both the models. It denotes that a per cent increase in rainfall will increase AGDP by 0.29per cent in Model II and 0.31 per cent in Model III respectively. The analysis shows that the explanatory variable of gross irrigated area has positive impact on AGDP in Model II and remains statistically highly significant. It denotes that a per cent increase in gross irrigated area will increases AGDP by 0.99 per cent.

The high R^2 values 0.99 and 0.99 in Model II and III implies that about 99 per cent variation in agricultural gross domestic product is explained by the independent variables included in the both the models. The F-calculated values 736.86 in Model II

and 742.44 in Model III suggest that the independent variables included in the models have collectively made significant impact on the agricultural gross domestic product. The low value of Durbin-Watson test for autocorrelation suggests the presence of autocorrelation. The combined elasticities of explanatory variables included in both the models shows that there is Increasing Returns to Scale in agricultural gross domestic product during the period 1975-76 to 2009-10.

Here also in Table 5.6., the study uses the Variance Inflation Factor (VIF) to check the presence of multicollinearity in the estimated models of the Cobb-Douglas production function presented in Table 5.5., which are heteroskesdasticity-corrected per cultivated ten lakh hectares models.

Table 5.6 Variance Inflation Factors (VIF) for the Models of Table 4.5

Variables	Model I	Model II	Model III
lnphIC	108.109	57.397	10.871
lnphAL	4.762	4.335	3.955
LnphRN	1.876	1.867	1.759
lnphFC	103.251		
lnphGIA	120.089	56.096	
D	1390.344	587.915	259.760
D*lnphIC	1609.049	591.335	312.105

Note: VIF (j) = 1/ [(1-R (j)^2], where R (j) is the multiple correlation coefficient between variable j and the other independent variables. Minimum Possible value = 1.0 and Values > 10.0 may indicate a collinearity problem.

In Model I, II, III, all the explanatory variables have multicollinearity problem except the variables of agricultural labour force and rainfall whose values lies between 1.0 to 10.0. Even when the study excludes the variable of fertilizer consumption in Model II and both fertilizer consumption and gross irrigated area from Model III, the result remains the same which we obtained in Model I.

Table 5.7 represents the models of regression results which are heteroscedasticity-corrected log difference variables. We have taken the log difference of all the included variables because the study found the problem of

multicollinearity and autocorrelation in our earlier analysis. Here also the study excludes one or two explanatory variables from each of the model except the first model to determine the impact of institutional outstanding credit on agricultural gross domestic product during the reform period.

Table 5.7Determination of Agricultural Gross Domestic Product using Log Difference in Cobb-Douglas Production Function

Variables	Model I	Model II	Model III
Constant	0.048***	0.045***	0.058***
	(0.000)	*(0.006)*	*(0.000)*
lndfIC	-0.217	-0.349**	-0.393**
	(0.155)	*(0.018)*	*(0.015)*
lndfAL	0.199	0.314	0.049
	(0.266)	*(0.111)*	*(0.786)*
lndfGSA	0.678***	0.699***	0.779***
	(0.003)	*(0.002)*	*(0.000)*
lndfRN	0.219***	0.168***	0.198***
	(0.000)	*(0.000)*	*(0.000)*
lndfFC	-0.220**		
	(0.018)		
lndfGIA	0.644***	0.415**	
	(0.003)	*(0.027)*	
D	-0.032**	-0.034**	-0.033**
	(0.038)	*(0.031)*	*(0.031)*
D*lndfIC	0.398**	0.502***	0.439**
	(0.018)	*(0.003)*	*(0.019)*
R^2	**0.89413**	**0.85429**	**0.84718**
F (k, n-k)	**F (8, 25)**	**F (7, 26)**	**F (6, 27)**
	26.3937	**21.7782**	**24.9467**
	(0.000)	*(0.000)*	*(0.000)*
D-W (Durbin-Watson)	**2.0459**	**2.3297**	**2.4367**
Returns to Scale	**2.109**	**1.715**	**1.039**

Notes: Level of significance ***, **, * are denoted as 1 per cent, 5 per cent and 10 per cent respectively. *P values* under brackets denote the probability of the level of significance. *F* and *D-W* denotes the *F* Statistic and Durbin-Watson Statistic respectively.

First model is estimated by using all the explanatory variables to determine agricultural gross domestic product. Most the coefficient values of Model I remain statistically highly significant except the explanatory variables of agricultural labour. The explanatory variables like agricultural labour force, gross sown area, rainfall, gross irrigated area and cross product of dummy and institutional outstanding credit has positive impact on agricultural gross domestic product whereas the coefficient

values of the explanatory variables like institutional outstanding credit, fertilizer consumption and dummy have had no significant impact on agricultural gross domestic product. The coefficient value of the variable lndfIC is -0.22, which denotes that it has negative impact on AGDP during the period 1975-76 to 2009-10 and also remains statistically insignificant but during the post-reform period (1991-92 to 2009-10) the coefficient value of lndfIC is 0.39 which implies that an increase in institutional outstanding credit (input variable) by one per cent led to increases agricultural gross domestic product (output variable) by 0.39 per cent and remains statistically significant at 2 per cent level.

The coefficient of agricultural labour (lndfAL) is positive which is 0.20 but remain statistically insignificant in Model I. It suggests that a per cent increases in agricultural labour force will lead to increase in agricultural gross domestic product by 0.20 per cent. Similarly the explanatory variable of gross sown area has also positive impact on AGDP. The coefficient value of (lndfGSA) 0.68 signifies that a per cent increase in gross sown area during the entire taken period will lead to increase in agricultural gross domestic product by 0.68 per cent and remains statistically highly significant. The availability of water through rainfall has positive impact on the agricultural gross domestic product and remains statistically highly significant. It suggests that a per cent increase in lndfRN will increases lndfAGDP by 0.22 per cent. On the other side the coefficient value of log difference of gross irrigated area (lndfGIA) has also positive impact on log difference of agricultural gross domestic product and remains statistically highly significant. It shows that a per cent increase in gross irrigated area will lead to increase in AGDP by 0.64 per cent during the entire taken period. The coefficient value of the variable, fertilizer consumption (lndfFC) takes the negative sign but remains statistically significant at 2 per cent level which shows that the use of fertilizer has caused significant decline in AGDP.

The coefficient of dummy variable i.e., -0.03shows that economic reforms has had a negative impact on agricultural gross domestic product but remains statistically significant at 4 per cent level.

The overall significance of the model I can also be viewed from the value of the coefficient of multiple determination i.e. R^2. The value of R^2 (0.8941) indicates that about 89 per cent of the variation in the (log difference of) agricultural gross

domestic product is explained by the (log difference of) all explanatory variables included in the model over the period 1975-76 to 2009-10. The F-calculated value 26.39 shows that the explanatory variables included in the model collectively had significant impact on agricultural gross domestic product. There is presence of autocorrelation in the Model I which are shown by the d value. The estimated model gives high Increasing Returns to Scale during the period 1975-76 to 2009-10.

For estimating the impact of log difference of institutional outstanding credit on log difference of agricultural gross domestic product we exclude the explanatory variable of log difference of fertilizer consumption (lndfFC) from Model II and in Model III both log difference of fertilizer consumption (lndfFC) and log difference of gross irrigated area (lndfGIA). The coefficient values of log difference of institutional outstanding credit (lndfIC) in both the model denote that it has negative impact on log difference of agricultural gross domestic product (lndfAGDP), which remains statistically significant at 2 per cent level in both the model during the entire taken period. On the other hand during the post-reform period, the institutional outstanding credit has positive impact on AGDP in both the model. The coefficient values of 0.50in Model II and 0.44in Model III implies that a per cent increase in institutional outstanding credit during the post-reform period increases AGDP by 0.50 per cent and 0.44 per cent respectively and remains statistically highly significant in Model II and statistically significant at 2 per cent level in Model III.

In both the model log difference of agricultural labour force has positive impact on log difference of agricultural gross domestic product but remains statistically insignificant. A per cent increase in agricultural labour will increase AGDP by 0.31 per cent in Model II and 0.05 per cent in Model III respectively. Similarly the coefficient values lndfGSA has also positive impact on lndfAGDP. The coefficient values of 0.70 in Model II and 0.78 in Model III implies that a per cent increase in gross sown area will increase AGDP by 0.70 per cent in Model II and 0.78 per cent in Model III respectively which remain statistically highly significant in both the model. The estimated results in Table 5.7 depicts that the lndfRN coefficient values are 0.17 and 0.20 in Model II and III respectively which are statistically highly significant in both the model. The coefficient values suggest that an increase in rainfall by one per cent will increases AGDP by 0.17 per cent in Model II and 0.20 per cent in Model III respectively. On the other side, the coefficient value of lndfGIA

in Model II denotes that an increase in gross irrigated area by one per cent will increase agricultural gross domestic product by 0.42 per cent and remains statistically significant at 2 per cent level.

The coefficient values of dummy variable in both the model are -0.03 and -0.03 respectively but remain statistically significant at 3 per cent in both the model which implies that economic reform has negative impact on agricultural gross domestic product.

The estimated results depicts that over 85 per cent variations in log difference of agricultural gross domestic product in both the model are explained by the log difference of explanatory variables included in the model (R^2 = 0.8542 in Model II and 0.8471 in Model III. The F statistics are 21.78 in Model II and 24.95 in Model III. However, the low value in both the model of Durbin-Watson test for autocorrelation suggests the presence of autocorrelation. Both the model has fulfilled the condition of Increasing Returns to Scale with 1.72 in Model II and 1.04 in Model III respectively.

To check the presence of multicollinearity in the estimated models of the Cobb-Douglas production function which are presented in Table 5.7., the study uses the Variance Inflation Factor (VIF) to detect the presence of multicollinearity in the estimated models. Table 5.8 depicts the estimated results of the log linear heteroskedasticity-corrected cum log difference models.

Table 5.8 Variance Inflation Factors (VIF) for the Models of Table 5.7

Variables	Model I	Model II	Model III
lndfIC	5.334	4.508	4.493
lndfGSA	3.371	3.371	2.156
lndfAL	1.243	1.239	1.231
LndfRN	2.218	2.135	2.134
lndfFC	2.424		
lndfGIA	2.715	2.180	
D	2.528	2.461	2.440
D*lndfIC	6.525	6.184	6.184

Note: VIF (j) = 1/ [(1-R (j)^2], where R (j) is the multiple correlation coefficient between variable j and the other independent variables. Minimum Possible value = 1.0 and Values > 10.0 may indicate a collinearity problem

The estimated models depicts that there is no multicollinearity presence in all the explanatory variables in all the models. This can be happen when we take the log difference of both dependent and independent variables. Based on the VIF, all the values of the explanatory variables in the models are varying in between 1.0 to 10.0, which indicates no multicollinearity presence in the model.

5.2. Conclusions

The purpose of the study is to provide econometric evidence of the impact of institutional outstanding credit on agricultural gross domestic product during the period 1975-76 to 2009-10.We have estimated Cobb-Douglas production function for the entire taken period to measure the resulting coefficients (elasticities) of each input (Institutional outstanding credit, Gross sown area, Gross irrigated area, fertilizer consumption and Agricultural labour) with respect to output (Agricultural gross domestic product).We take dummy variable for the period 1975-76 to 1990-91 (pre-reform period) and for the period 1991-92 to 2009-10 (post-reform period).These explanatory variables have determined the agricultural gross domestic products which are shown in five different models. Except for the first model the study excludes one or two explanatory variables in each model to reject the null hypothesis. The study dropped independent variable of Fertilizer consumption in model II, explanatory variables of Fertilizer consumption and Gross irrigated area in model III.

To avoid the problem of multicollinearity, all the variables included in the study (the dependent as well as all the independent variables) are transformed into per cultivated ten lakh hectares and then estimated the Cobb-Douglas type production function. But still all the estimated models show the presence of multicollinearity and therefore we have taken the log difference.

The overall findings of our empirical exercise can be drawn from the Table 5.7.,which shows that there was no multicollinearity presence in the explanatory variables in the entire model. It shows that if we take the log difference of dependent and independent variables there is no multicollinearity presence in the estimated models. The empirical results obtained from Table 5.7 indicate that in Model I, institutional outstanding credit has negative impact on agricultural gross domestic product during the period 1975-76 to 2009-10and remains statistically insignificant but during the post-reform period it has positive impact on agricultural gross domestic

product which is statistically significant at 2 per cent level. Thus for Model I we reject the null hypothesis which shows the phase of Increasing Returns to Scale.

The result in Model II and III concludes that institutional outstanding credit to agriculture has negative impact on agricultural gross domestic product during the entire taken period and remains statistically significant at 2 per cent level. But during the post-reform period it has positive impact on agricultural gross domestic product and remains highly statistically significant in Model II and statistically significant at 2 per cent level in Model III respectively. So the empirical results in Model II and Model III conclude that we reject the null hypothesis to accept the alternative hypothesis which shows that the institutional outstanding credit to agriculture has had positive impact on agricultural gross domestic product. In both the Model (II and III) we found the phase of Increasing Returns to Scale during the period 1975-76 to 2009-10.

Chapter-6

Conclusions and Suggestions

CHAPTER-6

CONCLUSION AND SUGGESTIONS

The economy of India being predominantly agriculture in character, the importance of the institutional credit to the agriculture sector can hardly be underestimated. It has been assigned a vital role in agricultural development of the country. Access to institutional credit to more farmers and appropriate quantity and quality of agricultural credit are crucial for realizing the full potential of agriculture as a profitable activity. Creation of adequate credit facilities has been identified as the principal solution for most of the agricultural problems. This is because about eighty per cent of Indian farmers were small and marginal whose farm savings are inadequate for financing their various agricultural activities and to carry out improvements in productivity of their agricultural operations. The institutional credit to agriculture is required not only for current inputs due to introduction of high yielding varieties, but also for uniform investments in the light of multiple cropping, increased cropping intensity, suitability and accuracy required in agricultural operations in the new strategy and increased irrigation requirements. In this way, the provision of adequate credit facilities not only fulfill the financial needs of the farmers but also enhances and ensures timely utilization of agricultural inputs through the adoption of new technologies for technically efficient achievement.

Since the introduction of economic reforms in 1991, the structure of the institutional credit to agriculture has changed drastically. The Narasimham Committee (Committee on Financial Systems), appointed by the Government of India in 1991, has provided various measures in the area of agricultural credit. These measures were related to the reduction in statutory liquidity ratio (SLR) and cash reserve ratio (CRR), abolition of branch licensing system for opening new bank branches, deregulation of interest rates of co-operatives and regional rural banks, deregulation of lending rates of commercial banks for loans above ₹ 2 lakh, recapitalization of selected regional rural banks, introduction of prudential accounting norms relating to income recognition, assets classification and provisioning requirements for all rural credit agencies, increased refinance support from RBI and capital contribution to NABARD,

setting up of the Rural Infrastructure Development Fund (RIDF) in NABARD for infrastructure projects, introduction of Kisan Credit Card Scheme (KCCS), doubling the flow of agricultural credit by all financial institutions during the period 2004-05 to 2006-07 and introduced a scheme for debt waiver and debt relief for farmers.

To comprehend the different effects of banking sector reforms on agricultural finance the current research is to evaluate the specific objectives to see the role of banking sector in agricultural finance during the post-reform period in India:

(i) To analyse the share (trends and composition) of institutional credit to agriculture sector during the post-reform period in India.

(ii) To examine the inter-regional variation in the disbursement of agriculture credit during the post-reform period in India.

(iii) To measure the credit gap among farmers across the size of land holding during the post-reform period in India.

(iv) To estimate the contributed share of institutional credit to agricultural production during the post-reform period in India.

In view to the importance of institutional credit to agriculture, the present study is related to the period 1975-76 to 2009-10. This period has been divided into two sub-periods viz., pre-reform period (1975-76 to 1990-91) and post-reform period (1991-92 to 2009-10). The analysis is based at all-India level and for six regions of the country.

6.1. Conclusions

The overall conclusions emerging from the analysis of institutional credit to agriculture are briefly provided below:

- The analysis at all India level shows that the trends of institutional outstanding credit to agriculture during the post-reform period were increasing and high as compared to the pre-reform period. A similar situation was also found for both direct and indirect institutional outstanding credit. Although the trends of both direct and indirect institutional outstanding credit during the post-reform period were increasing but the trend of direct institutional credit to agriculture

was higher than the trend of indirect institutional outstanding credit to agriculture.

- The share of direct short-term institutional outstanding credit has continuously fallen during the pre-reform period till the end of the1980s. But during the post-reform period the share has increased continuously and maintained the share to more than half of the total credit in 2009-10. On the other hand, the share of direct long-term institutional outstanding credit was increasing continuously during the pre-reform period with some fluctuation in late 1970s but after that it increased tremendously up to 1990-91. While during the post-reform period, the share fell continuously to less than 50 per cent in 2009-10.

- The study found that there is a marginal decline in the growth of agricultural institutional outstanding credit (both direct and indirect) during the post-reform period as compared to the pre-reform periods' growth.

- The growth of both direct short and long-term institutional outstanding credit to agriculture during the post-reform period is lower as compared to the pre-reform periods' growth. In comparison between short and long-term direct institutional outstanding credit to agriculture during the post-reform period, the growth of short-term is higher as compare to the growth of long-term credit.

- The growth rates of total direct institutional outstanding credit (both in nominal and real terms) to agriculture were lower during the post-reform period as compare to the growth of pre-reform period. The study examines the direct institutional outstanding credit to gross cropped area per ten lakh hectares at 2004-05 prices. Here also, the growth is lower during the post-reform period as compare to the pre-reform period.

- An analysis in the distribution of agricultural institutional outstanding credit by multi-agency approach (comprises scheduled commercial banks, co-operatives and regional rural banks) shows that the share of co-operatives to the total institutional outstanding credit to agriculture during the post-reform period was increasing and contributed more than half at the end of the decade of 1990s but in 2000s it started to fall continuously and contributed less than

one-third of the total institutional outstanding credit to agriculture in 2009-10. On the other hand, the share of scheduled commercial banks to the total institutional outstanding credit to agriculture during the post-reform period was fluctuating till the year 1999-2000 and after that it started to rise and contributed more than half of the total credit to agriculture during the end of the decade 2000s. The share of the regional rural banks to the total institutional outstanding credit to agriculture has increased continuously but contributed less than 10 per cent during the post-reform period. During this period, the scheduled commercial banks outstanding credit to agriculture has higher variability followed by regional rural banks and co-operatives respectively.

- The finding shows that the compound annual growth rate of institutional outstanding credit to agriculture by co-operatives is little better during the post-reform period than the pre-reform period while that ofscheduled commercial banks and regional rural banks are better during the pre-reform period than the post-reform period. Nonetheless, the compound annual growth rate of regional rural banks is higher as compared to that of scheduled commercial banks and co-operatives during the post-reform period.

- There is a wide variation in the availability of institutional outstanding credit to agriculture in different regions. The region-wise growth of institutional outstanding credit to agriculture by scheduled commercial banks shows that the growth rate is higher in all the regions during the later post-reform period (2001-10) as compared to the early post-reform period (1992-2000). However, the growth rates were much higher in the case of North-Eastern, Eastern and Central regions during the later post-reform period. But the increase in the growth rate is steep in the case of North-Eastern region during the same period. Thus the growth rate of agricultural institutional outstanding credit was uneven throughout the sub-periods as well as across the regions. During the entire post-reform period (1992-2010) the growth is higher in Northern and Western regions as compared to the growth rate of all India. On the other hand, the growth rate of the North-Eastern region is less impressive as compared to the other regions of the country during the entire post-reform period.

- The study found that Northern region has higher variability in the distribution of institutional outstanding credit to agriculture by scheduled commercial banks as compare to the other regions during the post-reform period. Whereas the North-Eastern region has less variability as compare to the other regions of the country during the same period.

- The distribution of direct institutional outstanding credit to farmers by scheduled commercial banks by size-class of land holdings at the all India level shows that during the early decade of post-reform era (1990s), the share of credit obtained by marginal and medium/large farmers declined marginally because of the minimal increase in the share of credit obtained by small farmers. But in period of 2000s the opposite was happening. The proportion of credit disbursed to marginal farmers increased substantially which causes the decline in the share of credit obtained by medium/large farmers. During the same period there was marginal increase in the share of the small farmers.

- The proportion of credit disbursed to medium/large farmers is still almost half of the credit disbursed to agriculture. However, during the decade of 1990s the growth of all size-classes of farmers is less impressive as compare to the growth of the same during the decade of 2000s.

- The analysis found that there is higher variability in the disbursement of credit to medium/large farmers as compared to the variability of marginal and small farmers during the post-reform period.

- The finding shows that on the one hand, the growth in the distribution of loan accounts under direct finance held by medium/big farmers are higher as compared to the growth of marginal and small farmers during the post-reform period although there is a negative growth during the decade of 2000s. On the other hand, the loan accounts held by the medium/large farmers has higher variability as compared to the marginal and small farmers during the post-reform period.

- The distribution of institutional outstanding credit to agriculture by credit limit of less than ₹ 25,000 shares has fallen continuously and drastically during the post-reform period. This fall was because of the drastic fall in the share of

direct agricultural advances. The share of agricultural advances with credit limit between ₹ 25,000 and ₹ 2 lakh has increased significantly during the post-reform period because of the significant increase in the share of the direct agricultural advances to the same credit limit size (around half of the direct finance to agriculture was accounted by this credit limit size in 2009-10). The share of credit limit size in between ₹ 2 lakh and ₹ 10 lakh has also increased continuously during the post-reform period. Here also, the increase was contributed by substantially increase in the share of direct agricultural advances. The share of the credit limit size in between ₹ 10 lakh and ₹ 1 crore and in between ₹ 1 crore and ₹ 10 crore to the total agricultural advances was increasing marginally and contributed less than 10 per cent each during the entire post-reform period. The credit limit in between ₹ 10 crore to ₹ 25 crore shares to total agricultural advances was fluctuating and contributed 2.80 per cent in 2009-10. However, the share of ₹ 25 and above crore has increased continuously during the post-reform period because it contributed more than half of the share of indirect agricultural advances to total.

- The percentage share of number of loan accounts in case of less than ₹ 25,000 declined drastically from almost 98 per cent in the early post-reform period to less than half of the total number of loan accounts at the end of the 2000s. This decline was because of the consistently and tremendously fall in the share of direct and indirect loan accounts to total loan accounts. The share in total loan accounts with credit limit size between ₹ 25,000 and ₹ 2 lakh has increased considerably during the post-reform period, accounting more than half of the loan accounts for agricultural advances during the year 2009-10, which were contributed by the increased share of both direct and indirect agricultural credit advances. The share of the loan accounts of credit limit size of above ₹ 2 lakh was insignificant during the entire post-reform period.

- The study provides the impact of institutional outstanding credit to agricultural gross domestic product during the period 1975-76 to 2009-10, which is shown in three different models. Except for the first model, the study excludes the explanatory variable of Fertilizer consumption in Model II and from Model III, we excludes Fertilizer consumption and Gross Irrigated Area (explanatory variables) to reject the null hypothesis.

- ❖ The result in Model II and III concludes that institutional outstanding credit to agriculture has negative impact on agricultural gross domestic product during the entire taken period and remains statistically significant at 2 per cent level. But during the post-reform period it has positive impact on agricultural gross domestic product and remains highly statistically significant in Model II and statistically significant at 2 per cent level in Model III respectively. In both the Model (II and III) we found the phase of Increasing Returns to Scale during the period 1975-76 to 2009-10.

- ❖ The overall finding of our empirical exercise can be drawn from Model I which represents that institutional outstanding credit to agriculture has negative impact on agricultural gross domestic product during the period 1975-76 to 2009-10 and remains statistically insignificant. But during the post-reform period it has positive impact on agricultural gross domestic product which is statistically significant at 2 per cent level. Thus, Model shows the phase of Increasing Returns to Scale.

6.2. Suggestions

The current study brings out the fact that the supply of institutional credit to the agriculture sector continues to be inadequate. On this ground, several committees/working groups/task forces have been constituted to suggest ways to increase the availability of institutional credit to the agriculture sector. These are the "The High-Level Committee on Agricultural Credit through Commercial Banks" (Chairman: R.V. Gupta, 1998), "Task Force to study the Functions of Co-operative Credit System and to Suggest measures for the Strengthening" (Chairman: Jagdish Capoor, 1999), "Expert Committee on Rural Credit" (Chairman: V.S. Vyas, 2001), and "The Working Group to suggest Amendments in the Regional Rural Banks Act, 1976" (Chairman: M.V.S. Chalapathi Rao, 2002), "Report of the Advisory Committee on Flow of Credit to Agriculture and Related Activities from the Banking System" (Chairman: V.S. Vyas, 2004), "Draft on Technical Paper by the Internal Working Group on Priority Sector Lending" (Chairman: C.S. Murthy, 2005),"Report of the Expert Group on Agricultural Indebtedness" (Chairman: R. Radhakrishna, 2007), "Report of the Internal Working Group to Examine the Recommendations of the Radhakrishna Expert Group on Agricultural Indebtedness" (Chairman: V.S. Das,

2008), etc. Based on the analysis done and conclusions arrived at from the study, certain suggestions are drawn which are made to improve the agricultural finance and bringing up the differential access to credit by different farmers. The suggestions are as follows:

- ❖ It may be suggested that the growth in regard to the total institutional outstanding credit to agriculture must be increased. This is because the majority of farmers in India are still not in position to save from their low incomes for agricultural purposes as well as to protect them from the moneylenders, relatives, traders, etc.

- ❖ The variability in the institutional credit to agriculture by co-operatives, scheduled commercial banks and regional rural banks should be reduced. This will help to encourage the confidence of farmers towards formal institutions for their credit requirement.

- ❖ For improving the conditions and productivity of farmers, co-operatives, scheduled commercial banks and regional rural banks should make concerted efforts in the disbursement of agricultural credit to keep pace with the rising cost on cultivation. This will provide an incentive to the farmers to adopt the latest technology for attaining higher productivity.

- ❖ There is a wide range of inter-regional variation in the accessibility of institutional credit for agriculture. The accessibility was higher in the case of developed agricultural regions whereas it is low in backward agricultural regions like North-Eastern region. Thus, the disbursement of agricultural credit should be distributed equally and should be given more emphasis on the North-Eastern region which has capability to increase agricultural production.

- ❖ The growing shift in the share of loans towards small and marginal farmers needs to be maintained. The credit should be disbursed through cooperatives keeping in view the easy access and lower transaction cost in this institution.

- ❖ The empirical result denotes that institutional outstanding credit to agriculture has positive impact on agricultural gross domestic product during the post-reform period. The institutional agencies should maintain this positive relationship for improving further agricultural production.

In addition to this, the recent policy changes announced both by the central and state governments with respect to rural credit structure as well as the latest ideas expressed by few scholars regarding the rural credit system are also taken into consideration. Taking this as cue some other suggestions which can be implemented to ensure the farmers towards institutional agencies for their credit requirements are made. These are:

- The acquisition of agricultural credit by the farmers did not entirely cover the cost of production. In this context, it may be suggested that credit should be given on the basis of cost of cultivation rather on the basis of credit worthiness of the borrowers.

- Income of the farmers from agriculture is seasonal and therefore cash flow is not continuous. The formal institutions should finance consumption loans for unproductive purposes along with the productive loans so as to make the cash flow a continuous process. Further, the consumption finance should be liberal within the repaying capacity of the borrower. This can reduce the farmers' dependency on non-institutional sources for their unproductive credit requirements.

- The time consuming process of institutional loans (borrowers have to wait for a month after applying for loan) diverted the farmers towards non-institutional loans (borrowers need not to wait for a longer period of time) for their credit requirements. The institutional agencies should take this fact into consideration. For this reason, the lending procedure of institutional agencies should be made easier and convenient so that the small and marginal farmers are able to meet their credit requirements at the time of need. This would save them from the exploitative traps of private credit agencies such as moneylenders, traders, relatives, etc.

- Education and awareness of the farmers should be improved as it will help them in availing loans timely and enable them to develop a sense of responsibility and hence a willingness for repayment of bank loans which will check the wilful defaults.

- Awareness amongst the farmers related to the discouragement of loans on non-productivity expenditure (dwelling houses and social ceremonies) should be made through community education programmes.

- To ensure repayment of bank loans in time, bank officials should develop mutual relationship with the potential borrowers through visiting during pre and post-lending periods of farm operations. It helps the bankers to understand credit requirements of the farmers during the pre-lending period, and monitoring and supervising the utilisation of loan amount in an effective manner.

- There should be minimum proportion of total agricultural credit to be reserved for marginal and small farmers. Otherwise the gap between the big farmers and the small and marginal farmers will be increased further.

- The differential rate of interest should be made on the basis of operational holding rather than purpose of borrowing. This will obstruct the flow of credit to undesirable expenses by higher farm size categories and at the same time availability will increase to lower farm size categories.

- Not only the sufficient quantity with reasonable rates of interest of the loan disbursement must be made in proper time but also steps should be taken accordingly by the banks for appropriate amendments and improvements in the present situation of agriculture financing.

Crucial consideration of these suggestions might make it possible to utilize the majority share of loans for productive purposes. This might also help and facilitate the improvement in the economic condition of most of the farmers of the country.

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Appendices

Appendix Table 1

Institutional Credit as per cent of Agricultural Gross Domestic Product

(Per cent)

Year	Direct Outstanding Credit	Indirect Outstanding Credit	Total Outstanding Credit
1975-76	12.13	3.29	15.43
1976-77	14.51	3.81	18.32
1977-78	14.07	4.45	18.52
1978-79	16.31	5.49	21.79
1979-80	19.53	5.72	25.25
1980-81	18.24	6.25	24.50
1981-82	18.61	6.70	25.31
1982-83	19.46	7.97	27.43
1983-84	19.26	7.71	26.97
1984-85	21.26	8.33	29.59
1985-86	23.57	9.01	32.59
1986-87	24.30	7.99	32.29
1987-88	25.77	8.17	33.95
1988-89	23.37	7.29	30.66
1989-90	24.73	6.85	31.57
1990-91	22.36	6.17	28.53
1991-92	20.17	5.72	25.90
1992-93	19.83	5.43	25.26
1993-94	18.48	10.59	29.08
1994-95	17.71	11.13	28.84
1995-96	18.38	11.08	29.46
1996-97	16.82	10.54	27.36
1997-98	17.13	10.99	28.12
1998-99	15.61	10.61	26.21
1999-00	20.90	23.77	44.66
2000-01	23.58	28.96	52.54
2001-02	25.08	29.31	54.39
2002-03	30.44	32.91	63.35
2003-04	32.94	32.48	65.42
2004-05	40.08	35.09	75.18
2005-06	44.60	37.57	82.17
2006-07	47.28	41.38	88.66
2007-08	42.12	39.10	81.21
2008-09	44.32	32.29	76.61
2009-10	47.39	32.99	80.39

Appendix Table 2

Trends in the Share of Short and Long-term Credit as Percentage of Total Direct Institutional Agricultural (Outstanding) Credit in India

(Per cent)

Year	Short-term	Long-term
1975-76	43.73	56.27
1976-77	43.56	56.44
1977-78	42.91	57.09
1978-79	44.15	55.85
1979-80	44.09	55.91
1980-81	43.11	56.89
1981-82	43.91	56.09
1982-83	38.07	61.93
1983-84	37.65	62.35
1984-85	36.60	63.40
1985-86	36.07	63.93
1986-87	34.88	65.12
1987-88	34.82	65.18
1988-89	35.97	64.03
1989-90	34.41	65.59
1990-91	34.12	65.88
1991-92	33.46	66.54
1992-93	34.11	65.89
1993-94	35.02	64.98
1994-95	35.25	64.75
1995-96	38.66	61.34
1996-97	39.29	60.71
1997-98	39.45	60.55
1998-99	40.97	59.03
1999-00	38.90	61.10
2000-01	40.70	59.30
2001-02	42.88	57.12
2002-03	44.04	55.96
2003-04	46.59	53.41
2004-05	45.15	54.85
2005-06	45.10	54.90
2006-07	46.33	53.67
2007-08	53.90	46.10
2008-09	55.55	44.45
2009-10	58.48	41.52

Appendix Table 3

Growth of Direct Institutional Credit (Outstanding) to Agriculture

(₹ crore)

Year	Short-term	Long-term	Total Credit at Current Prices	Total Credit at Constant Prices	Per Cropped Area (Ten Lakh Hectares)
1975-76	1377	1772	3149	23764.90	138.73
1976-77	1667	2160	3827	28292.89	169.08
1977-78	1894	2520	4414	31016.74	180.09
1978-79	2299	2908	5207	36589.07	209.32
1979-80	2814	3568	6382	38291.95	225.79
1980-81	3250	4289	7539	38254.58	221.60
1981-82	3792	4843	8635	40077.60	226.75
1982-83	3685	5995	9680	42829.13	247.93
1983-84	4339	7185	11524	47416.94	264.07
1984-85	5006	8670	13676	52851.27	299.73
1985-86	5856	10377	16233	60081.48	336.67
1986-87	6236	11645	17881	62540.34	354.52
1987-88	7342	13742	21084	68193.10	399.40
1988-89	8561	15239	23800	71636.10	393.00
1989-90	9527	18160	27687	77551.95	425.48
1990-91	10002	19313	29315	74471.60	400.95
1991-92	10419	20723	31142	69556.91	381.68
1992-93	11687	22576	34263	69534.22	374.44
1993-94	12952	24037	36989	69280.40	371.32
1994-95	14361	26378	40739	67765.67	360.36
1995-96	17793	28227	46020	70884.42	378.11
1996-97	20009	30911	50920	74978.90	395.67
1997-98	21469	32950	54419	76752.10	403.98
1998-99	23521	33886	57407	76420.26	398.75
1999-00	31659	49724	81383	104907.34	556.83
2000-01	37302	54352	91654	110255.58	594.88
2001-02	45234	60268	105502	122507.90	650.63
2002-03	54224	68905	123129	138261.76	787.46
2003-04	70454	80774	151228	161029.02	847.16
2004-05	86259	104791	191050	191050.00	997.39
2005-06	107988	131451	239439	229128.23	1186.89
2006-07	132477	153436	285913	256654.40	1326.45
2007-08	162596	139082	301678	258728.99	1325.73
2008-09	198623	158908	357531	283754.76	1454.41
2009-10	256256	181942	438198	335013.76	1731.70

Appendix Table 4

Distribution of Institutional Credit (Outstanding) to Agriculture by Different Institutions

(₹ crore)

Year	Co-operatives	Scheduled Commercial Banks	Regional Rural Banks	Total
1975-76	2594	1092	0	4001
1976-77	3053	1381	0	4833
1977-78	3454	1851	0	5809
1978-79	3864	2459	0	6960
1979-80	4193	3097	181	8252
1980-81	4953	4041	196	10123
1981-82	5661	4699	294	11744
1982-83	6493	5453	405	13644
1983-84	7435	6672	536	16137
1984-85	8562	8072	726	19035
1985-86	9833	9782	904	22440
1986-87	9597	10779	1095	23763
1987-88	10660	12934	1348	27771
1988-89	11790	14381	1596	31224
1989-90	12796	16712	1886	35353
1990-91	12886	18221	1777	37408
1991-92	14663	18414	2023	39976
1992-93	16360	19840	2246	43654
1993-94	28728	21212	2593	58187
1994-95	33327	23786	3042	66345
1995-96	36532	27101	3502	73764
1996-97	40260	31313	4087	82811
1997-98	42207	34780	4696	89481
1998-99	44221	37936	5414	96414
1999-00	109311	46410	6020	173930
2000-01	125702	57095	7249	204232
2001-02	141202	63344	8286	228768
2002-03	151984	77494	10261	256245
2003-04	173710	96623	11721	300360
2004-05	188954	131590	16709	358315
2005-06	202259	192778	21510	441110
2006-07	225835	251582	27452	536131
2007-08	213648	296239	33216	581718
2008-09	213813	366821	37367	618001
2009-10	235956	460990	46282	743228

Appendix Table 5

Region-wise distribution of Institutional Credit (Outstanding) to Agriculture by Scheduled Commercial Banks

(₹ crore)

Year	Northern	North-Eastern	Eastern	Central	Western	Southern	India
1991-92	3536	407	2277	3600	3074	7347	20241
1992-93	3788	390	2564	3903	3632	7783	22061
1993-94	4186	402	2560	4029	3139	8521	22837
1994-95	4173	324	2424	3904	3848	9526	24199
1995-96	4704	342	2638	4307	4462	11035	27488
1996-97	5308	556	3186	4770	5377	13213	32410
1997-98	6295	427	3464	5333	6024	14235	35778
1998-99	7181	467	3843	6039	7480	16201	41211
1999-00	9470	464	4411	6929	11142	17017	49434
2000-01	12431	465	5094	7975	13670	19676	59310
2001-02	14458	476	5918	10599	12131	21236	64819
2002-03	17564	519	7197	11624	16865	26779	80547
2003-04	22031	603	8353	14443	20179	33694	99302
2004-05	32226	725	12151	19882	20595	46056	131636
2005-06	47387	1066	16945	28800	29607	68168	191973
2006-07	61277	1339	20049	37439	48626	85963	254693
2007-08	69630	2436	26760	45988	61613	101659	308087
2008-09	86980	2731	34258	56940	61691	132993	375593
2009-10	109442	3086	40603	71112	73588	165492	463323

Appendix Table 6

Distribution of Direct Finance (Short and Long-Term) to Farmers According to Size of Land Holdings by Scheduled Commercial Banks (Outstanding)

(₹ crore)

Year	Marginal (Up to 2.5 Acres)	Small (Above 2.5 acres to 5 Acres)	Medium and Large (Above 5 Acres)	Total
1991-92	3239	3050	7058	13347
1992-93	3437	3328	7444	14209
1993-94	3595	3411	7902	14908
1994-95	3889	3659	8359	15907
1995-96	4326	4295	9265	17886
1996-97	4894	5033	10469	20396
1997-98	5058	5442	11752	22252
1998-99	5511	5680	12651	23842
1999-00	6185	6445	14719	27349
2000-01	7215	7308	16963	31486
2001-02	8759	9686	19083	37528
2002-03	9813	11316	23831	44960
2003-04	14805	13974	28786	57565
2004-05	20499	20759	37218	78476
2005-06	29719	29255	52769	111743
2006-07	37336	37815	64810	139961
2007-08	46457	46631	80956	174044
2008-09	60199	59792	99349	219340
2009-10	77952	72916	119500	270368

Appendix Table 7

Distribution of Number of Loan Accounts under Direct Outstanding Finance (Short and Long-term Loans) to Farmers According to Size of Land Holdings by Scheduled Commercial Banks

(₹ Thousand)

Year	Marginal (Up to 2.5 Acres)	Small (Above 2.5 acres to 5 Acres)	Medium and Large (Above 5 Acres)	Total
1991-92	6063	4439	3669	14170
1992-93	6057	4460	3878	14395
1993-94	6007	4282	3637	13926
1994-95	5463	4047	3492	13002
1995-96	5557	4255	3461	13273
1996-97	5296	4219	3575	13090
1997-98	4890	4034	3354	12278
1998-99	4408	3711	3389	11508
1999-00	4544	3777	3379	11700
2000-01	4600	3689	3555	11844
2001-02	4902	3961	3394	12257
2002-03	4749	4092	3835	12676
2003-04	6086	4806	4377	15269
2004-05	7299	5874	5274	18447
2005-06	8239	6677	6321	21237
2006-07	9954	7548	6985	24487
2007-08	11345	9512	8739	29596
2008-09	11708	9570	10884	32162
2009-10	17321	14220	17657	49198

Appendix Table 8

Agricultural Gross Domestic Product and Nominal Institutional (Outstanding) Agricultural Credit

(₹ crore)

Year	Agricultural Gross Domestic Product at current prices	Nominal Institutional Outstanding Credit
1975-76	25936	4001
1976-77	26378	4833
1977-78	31373	5809
1978-79	31935	6960
1979-80	32685	8252
1980-81	41326	10123
1981-82	46397	11744
1982-83	49736	13644
1983-84	59836	16137
1984-85	64334	19035
1985-86	68864	22440
1986-87	73583	23763
1987-88	81807	27771
1988-89	101853	31224
1989-90	111974	35353
1990-91	131108	37408
1991-92	154377	39976
1992-93	172814	43654
1993-94	200114	58187
1994-95	230030	66345
1995-96	250426	73764
1996-97	302674	82811
1997-98	318171	89481
1998-99	367722	96414
1999-00	389414	173930
2000-01	388722	204232
2001-02	420596	228768
2002-03	404491	256245
2003-04	459158	300360
2004-05	476634	358315
2005-06	536822	441110
2006-07	604672	536131
2007-08	716276	581718
2008-09	806646	618001
2009-10	924581	743228

Appendix Table 9

Nominal and Real Institutional Outstanding Credit per Cropped Area (Ten lakh Hectares)

(₹ crore)

Year	Nominal Institutional Outstanding Credit per Cultivated Area	Real Institutional Outstanding Credit per Cultivated Area
1975-76	23.36	176.27
1976-77	28.88	213.53
1977-78	33.73	237.00
1978-79	39.82	279.79
1979-80	48.66	291.95
1980-81	58.64	297.55
1981-82	66.44	308.39
1982-83	78.98	349.45
1983-84	89.87	369.78
1984-85	107.95	417.18
1985-86	125.74	465.40
1986-87	134.70	471.14
1987-88	162.65	526.07
1988-89	171.30	515.59
1989-90	193.96	543.29
1990-91	201.40	511.63
1991-92	219.36	489.95
1992-93	235.08	477.07
1993-94	311.86	584.12
1994-95	352.81	586.86
1995-96	393.47	606.06
1996-97	437.00	643.47
1997-98	470.98	664.26
1998-99	482.92	642.86
1999-00	923.20	1190.05
2000-01	1101.93	1325.57
2001-02	1214.98	1410.82
2002-03	1459.42	1638.79
2003-04	1580.18	1682.59
2004-05	1870.61	1870.61
2005-06	2284.95	2186.56
2006-07	2770.85	2487.29
2007-08	2980.72	2556.37
2008-09	3167.61	2513.98
2009-10	3841.77	2937.13

Appendix Table 10

Determinants of Agricultural Gross Domestic Product

Year	AGDP (in Crore)	Total Real Institutional Outstanding Credit at 2004-05 Prices (in Crore)	Agricultural Labour Force (in Thousand)	Gross Sown Area (Ten Lakh Hectares)	Rainfall in Millimetre (June-Sept.)	Gross Irrigated Area (Ten Lakh Hectares)	Consumption of Fertilisers (N+P+K) (lakh tonnes)
1975-76	222817	23764.90	195871	171.3	1011.4	43.36	28.94
1976-77	209266	28292.89	199067	167.33	901.5	43.55	34.11
1977-78	235455	31016.74	202258	172.23	911.3	46.08	42.86
1978-79	240148	36589.07	205482	174.8	965.2	48.31	51.17
1979-80	208060	38291.95	208765	169.59	724.8	49.21	52.55
1980-81	238102	38254.58	210777	172.63	912.1	49.78	55.16
1981-82	249645	40077.60	212815	176.75	887.1	51.41	60.64
1982-83	249296	42829.13	214875	172.75	767.4	51.83	63.88
1983-84	276104	47416.94	216953	179.56	1001.5	53.82	77.1
1984-85	280200	52851.27	219041	176.33	859.8	54.53	82.11
1985-86	280747	60081.48	221139	178.46	832.5	54.28	84.74
1986-87	279649	62540.34	223241	176.41	769.9	55.76	86.45
1987-88	274820	68193.10	225333	170.74	774.6	56.04	87.84
1988-89	321114	71636.10	227396	182.28	1094.1	61.13	110.4
1989-90	322384	77551.95	229417	182.27	920	61.85	115.68
1990-91	336176	74471.60	233024	185.74	972.3	63.2	125.46
1991-92	328407	69556.91	236592	182.24	828.3	65.68	127.28
1992-93	351584	69534.22	240122	185.7	831.7	66.76	121.55
1993-94	362764	69280.40	243616	186.58	905.7	68.26	123.66
1994-95	379959	67765.67	247073	188.05	1001.2	70.65	135.64
1995-96	376243	70884.42	250492	187.47	900.3	71.35	138.76
1996-97	415377	74978.90	253860	189.5	935.1	76.03	143.08
1997-98	403030	76752.10	257150	189.99	927.3	75.67	161.88
1998-99	431719	76420.26	260327	199.65	943.1	78.67	167.98
1999-00	442113	104907.34	263369	188.4	863.1	79.22	180.7
2000-01	439432	110255.58	266875	185.34	833.7	76.19	167.02
2001-02	467815	122507.90	270252	188.29	821.9	78.42	173.6
2002-03	429752	138261.76	273515	175.58	737.3	73.41	160.94
2003-04	476324	161029.02	276687	190.08	919.5	78.15	167.99
2004-05	476634	191050.00	252901	191.55	774.2	81.18	183.98
2005-06	502996	229128.23	256519	193.05	874.3	84.26	203.4
2006-07	523745	256654.40	258642	193.49	889.3	86.77	216.51
2007-08	556956	258728.99	261632	195.16	943	87.92	225.7
2008-09	555442	283754.76	264585	195.1	877.7	88.42	249.09
2009-10	559376	335013.76	267490	193.46	698.2	88.65	264.86